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

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CHAPTER 2

United States law, policies and practices

2.1 The emergence of the US private launch industry

2.1.1 Law, policies and practices in the pre-space shuttle era (1961-1982)

2.1.1.1 Launch vehicle development in the 1960s: DOD, NASA and the private manufacturers

President Eisenhower's military experience in World War II and his perception of the intentions of the Soviet Union in the post-war period made him a firm supporter of the development of intercontinental ballistic missiles (ICBM's) which could act as a deterrent to nuclear attack through its promise to deliver warheads to targets thousands of miles away. He also supported the development of reconnaissance satellites which would make the U.S. safe from surprise attacks.
Thus, in the years after his inauguration in 1952 the U.S. Air Force (USAF) developed the first ICBM, the Atlas (testfired in 1955 and operational in 1959). The Titan and -medium range- Thor missiles followed in the early sixties. At the Army's weapons development and missile center, Redstone Arsenal in Alabama, Wernher von Braun and his team of mostly German engineers developed a missile, based on World War II V2 technology, later called the Jupiter. And the Navy, in 1956, developed the Polaris, a solid-fueled IRBM for its submarines. Finally, the USAF was allowed to develop the Minuteman, a light, solid-fueled ICBM.
At the same time, the attractive concept of having reconnaissance satellites in low earth orbit led to a highly secret development program, consisting of the manufacture by Lockheed of a satellite armed with cameras, and of a two-stage rocket, known as the Agena.[1]

Separate from these military efforts, the US government approved a civilian project to study the upper atmosphere with a scientific satellite, to be launched

1. See Roger D. Launius, *NASA: A history of the U.S. civil space program*, USA (1994) hereinafter referred to as Launius, Chapter 1, *passim*.

by the non-military Viking rocket. Project 'Vanguard', as it was known, the U.S. contribution to the International Geophysical Year 1957/1958 of the International Council of Scientific Unions,[2] was meant to enhance national prestige, not by its scientific performance, but simply by its mere presence in orbit.

(An important additional goal for the U.S. government was the establishment of the precedent of free access to space, a prerequisite for having reconnaissance satellites in orbit without the risk of legal or military challenges on the part of the Soviet Union. To minimize the risk of such a challenge at the outset, it was important to have a non-threatening civil satellite in orbit first. The alternative, the Explorer proposal, submitted by the Army's Redstone Arsenal, would have involved an adapted ballistic missile launch vehicle, the Redstone or Jupiter. This was not acceptable).[3]

In the mean time, the Russians, with the assistance of their 'own' German V2 engineers, had also embarked upon the development of missiles. Unlike the Americans they concentrated their efforts immediately after the war on increasing the power and range of the rockets; this determination paid off and brought them ahead of their American competitors in the ICBM/long-range missile field.[4]

The two American projects (secret reconnaissance and public Vanguard) did not get off the ground, at least not before Sputnik I shook U.S. confidence in its technological superiority. There was a lack of focus, a lack of urgency and therefore a lack of money to really get things moving the way Eisenhower had planned it.
Sputnik I had a 'Pearl Harbor effect'[5] on American public opinion, not the least because of the apparent disparity of launch capabilities between the Soviet Union, which was able to launch nearly 200 pounds into orbit, and the U.S., planning to lift 3.5 pounds with the Vanguard program.[6] For people around the world, as one commentator observed, Sputnik epitomized the double nature of launchers: the same vehicle which had put a scientific satellite in orbit could, with some technical modifications and if associated with nuclear warheads, become the focus of a new and revulutionary weapon system.[7]

2. In 1952, the ICSU had decided to expand a polar research project to encompass a study of the upper atmosphere with the help of rockets with instrument packages attached; and in October 1954 the Council had adopted a resolution calling for the launch of artificial satellites during the IGY to help map the earth's surface.
3. See Launius, *supra* note 1, at 22-23.
4. See John Krige & Arturo Russo, *Europe in space 1960 - 1973*, ESA SP-1172, Netherlands (1994), hereinafter referred to as ESA SP-1172, at 6-8.
5. See Launius, *supra* note 1, at 25.
6. Sputnik II, launched on November 3, 1957, which carried Laika, a dog, into space, weighed even 1.120 pounds and stayed in orbit for almost 200 days, *ibid.*
7. See Lorenza Sebesta, *The availability of American launchers and Europe's decision 'to go-it-*

The good thing about the event was that it "created an illusion of a technological gap and provided the impetus for increased spending for aerospace endeavors, technical and scientific programs, and the chartering of new federal agencies to manage air and space research and development."[8] In other words, the crisis brought urgency, focus and money to the U.S. space effort. And it led to the creation of NASA as the agency that would coordinate U.S. civilian space activities.
An additional positive side effect was of a legal/political nature. The fact that Sputnik I (and II) had orbited the earth, overflying the territories of many sovereign nations without provoking a single protest, had, in the U.S. view, established the legal precedent for free access to and freedom of space which the U.S. administration had sought to obtain for its reconnaissance satellites.[9] The Soviet launch thus cleared the way for the previously rejected Army project, and in January 1958 a four-stage launch vehicle, the Juno 1, developed by the team of Wernher von Braun on the basis of a modified ballistic missile, placed Explorer1 in orbit. And Vanguard 1 followed less than 2 months later.

NASA's charter gave the agency both a research job and operational responsibilities. It would not only design and build launch vehicles and satellites, but it would also launch them, track them, acquire data from them, and interpret the data.[10] The first NASA 10-year plan was presented to Congress in 1960. It called for a greatly expanded program: manned flight, scientific satellites, lunar probes, and, for the launch of all these spacecraft, a family of launch vehicles, including very large ones to cater for the heavier payloads. In addition to the existing Redstone, Thor and Atlas vehicles, NASA plans included (further) development of the Scout booster for smaller payloads, Centaur (originally a Department of Defense project), an upper stage for lunar and planetary missions, and Saturn, also for bigger payloads. Where the Scout became a highly reliable small booster[11] it was particularly in the area of heavy lift vehicles that the U.S. felt the need to catch up with the Soviet Union.
The efforts of the NASA engineers in the early sixties brought modifications to existing missile derived boosters such as the Thor-Agena which could launch a 2,200 pound satellite into orbit, the Delta, a very successful family of launch vehicles for various medium-sized payloads, and the Titan, developed in the

alone', ESA HSR-18, Netherlands (1996), hereinafter referred to as ESA HSR-18, at 8.

8. See Launius, *supra* note 1, at 25.
9. *Id.* at 27-28.
10. See Frank W. Anderson, *Orders of Magnitude - A history of NACA and NASA, 1915-1980,* (The NASA History Series, NASA SP-4403) USA (1981), hereinafter referred to as Orders of Magnitude, at 22.
11. It was first launched on July 1, 1960, and soon became a 'workhorse', which could place a 330 pound satellite into earth orbit; by the end of 1968 it had a launch success rate of 85%, see Launius, *supra* note 1, at 44.

mid-sixties as the heavy-lift launcher of choice. (The Saturn would be developed by the von Braun team exclusively for the Apollo project)
At the same time the reliability of the launchers needed to be improved: by December 1959, of the 37 satellite launches attempted, less than one- third had actually attained orbit. So NASA imposed new and rigorous standards on all of its products and got DOD, whose vehicles they used, to impose those same standards on all contractors and component manufacturers.[12]

By the end of the 1960s, the U.S. had developed several sufficiently reliable and proven launch vehicle families, capable of meeting basically all the launch needs of the Government, both military and civilian:
- Scout, built by LTV Aerospace, with the launch-program managed by the Navy,
- Atlas, built by General Dynamics, and managed by the Air Force,
- Titan, built by Martin Marietta, and also managed by the Air Force,
- Delta, built by McDonnell Douglas, and managed by NASA,
- Saturn 1B, built by Chrysler and McDonnell Douglas, and managed by NASA and
- Saturn V, purpose-built for the manned lunar missions by Boeing, Rockwell and McDonnell Douglas and also managed by NASA, but out of production by the time of the first lunar landing.

The launch process was simple: NASA and the U.S. Air Force/Department of Defense, after having obtained the necessary Congressional authorization and appropriation of the required amounts, would procure the launch vehicles, built according to their specifications, from one of the above launcher manufacturing companies.[13] The launch would be performed at government launch facilities by the government agency concerned, with assistance (arranged under separate contract) from the manufacturer.[14] Both the civil and military satellite telecommunications and reconnaissance needs through the years produced a steady stream of government purchases of launch vehicles.

Long term, future-oriented research and development of launchers was not encouraged at this time. Congressional budgetary approval procedures would result in yearly authorization and appropriation battles often complicated by such factors as lack of local interest in a specific program or other political or budgetary priorities. In the absence of certainty and predictability of 'market

12. See Orders of Magnitude, *supra* note 10, at 24.
13. See Allen D. Webber, *Launching the rocket industry in the United States: domestic regulation of private expendable launch vehicles*, 50(1) J. Air L. & Com. 1-67 (1984), hereinafter referred to as Webber 1984, at 1, note 2.
14. See Edward A. Frankle, *Commercial ELV services and the National Aeronautics and Space Administration: Concord or discord?*, Proceed. 30th Colloq. L. Outer Space 216-223 (1987) herinafter referred to as Frankle: Concord or discord, at 219.

demand' and lack of foreign competition, there was little inclination to invest in new technology.[15]
The roles were thus quite clear: the industry, as government contractor, delivered the hardware and the government used that hardware to produce the launch service both for its own needs and for those of its partners in cooperative projects, such as individual countries and international organizations such as Europe's Space Research Organization (ESRO).

One of the programs undertaken by the U.S. in this period, namely that of *communications satellites*, is of particular note because of the major role it played in policy discussions both within the U.S. and Europe and between them on (the U.S. reaction to) the need for Europe to have access to space for its own communications satellites.
In 1960 NASA launched the experimental Echo satellite, a plastic balloon coated with aluminium, which was used as a passive reflector of telephone signals. It was followed in 1962 by Telstar, the first satellite which relayed live broadcast of television images across the Atlantic. Its handicap of limited visibility to the groundstations (because of the low earth orbit used) was not shared by its successor, Syncom, launched by NASA in 1963 into geostationary orbit (36.000 km. high): with its fixed position vis-a-vis the earth it was permanently visible and thus useable by earth stations on at least one-third of the earth's surface.
This experimental phase was concluded with the launch, in April 1965, of Early Bird, later renamed Intelsat I, which would inaugurate commercial communications satellite services between the U.S. and Europe.
The U.S. government had foreseen the enormous potential of the commercial use of communications satellites, and had entrusted the task of developing an international satellite system to Communications Satellite Corporation (Comsat), created in 1962. Comsat was a private company, with members of the Board of Directors appointed by the President, regulated by the Federal Communications Commission (FCC) and supervised by the State Department. Together with the U.S. government, Comsat was instrumental in getting the International Telecommunications Satellite Consortium, *Intelsat*, established, based on 'interim agreements' signed in August 1964 by 13 states plus Vatican City.
With the shares (and the concomitant voting power) apportioned on the basis of projected use of the system, the U.S., through Comsat, obtained a dominant position in the new organization. Comsat's role as manager of the system (no other person or entity at the time had the required know-how or experience in this field), its majority share and *de facto* veto power further strengthened the U.S. position. All satellite technology used was of American origin. The main U.S. communications firms, such as ITT and AT & T and the large U.S

15. See *infra* para 2.1.1.2 and Chapter 4 for the (lack of) European competition.

aerospace companies were influential shareholders of Comsat. And the new satellites, Intelsat II and III, orbited in 1967 and 1969 respectively, were -almost by definition- U.S.-made and launched. It is not surprising that the European members of Intelsat, some of whom did cherish the small consolation of having groundstations on their territory, felt less than comfortable with such U.S. dominance in this technologically, strategically and commercially important field. However, the existing technology gap between Europe and the U.S. was of such magnitude that the Europeans, in the mid-sixties, could not offer any viable alternative either in the field of communications satellite (component) technology or launch facilities. And with no concerted action on the scale of the American military and civil space research and development, there was little chance for Europe to soon have substantial influence on policy, become a -more or less- equal partner of the U.S., or get a fair share of the contracts awarded by the Consortium, let alone become an independent actor in this 'high tech' field.[16]
That is why in the years following the establishment of the Consortium, during which the parties prepared themselves for the negotiations (in 1969) on definitive arrangements creating the Intelsat Organization, relations between the U.S. and Europe were less than cordial.

2.1.1.2 Early U.S. launch policy vis-à-vis Europe

U.S.-European cooperation in space since the late fifties had consisted mainly of the U.S.Government/NASA offering space on board its satellites for European scientific experiments or providing launch services for European scientific payloads.
The U.S. strategy with respect to space cooperation with its European allies was based on the following 'pillar':

"demonstrating and reaffirming US political leadership among its allies by engaging them in cooperative ventures in which the US served mainly as the provider of launching facilities ... Launching services were intended to demonstrate, at a low price, US benevolence and advance with regards to her European counterparts and, at the very least, were to symbolize the benefits of a technologically oriented democratic society" *(sic!)*[17]

Such ventures, undertaken on a project-by-project basis were of a strictly scientific nature and each nation had to fund its own activities; thus no 'giveaways' and no exchanges of funds.[18] To that end, bilateral agreements

16. See ESA SP-1172, *supra* note 4, at 55-57; also, on the technology gap and the US reaction thereto, Lorenza Sebesta, *United States - European cooperation in space during the sixties*, ESA HSR-14, Netherlands (1994), hereinafter referred to as ESA HSR-14, at 19-21.
17. See ESA HSR-14, *supra* note 16, at 7.
18. *Id.*, at 8.

were signed throughout the sixties with such countries as the United Kingdom, France, Italy, Germany and other European (and non-European) countries. They would, for instance, arrange for the inclusion of national experiments in NASA programs, or involve launch arrangements for national satellites. The first in the latter category was the British Ariel 1 satellite, launched on April 26, 1962 from Cape Canaveral by Thor-Delta launch vehicle. Canadian, British, French and Italian satellite launches would follow, all based on bilateral cooperation agreements with NASA.[19]

With the birth of the European Space Research Organization (ESRO) and of the European Launcher Development Organization (ELDO), both in 1964,[20] NASA had found European counterparts to deal with. In that same year a Memorandum of Understanding was signed concerning the launch by NASA of ESRO's first two satellites, (still) free of charge, in exchange for free access to all scientific data thus obtained.[21]

It was only in 1966, at the time of both intra-European discussions on the (further) development of an autonomous launch and independent space research capability and of internal debate in the U.S. on the advisability of assisting Europe in this endeavor, that the character of the above U.S.-European launch relationship changed from one of cooperation and free scientific exchange into one based on 'purchase of launch services'. In that year, NASA and ESRO signed an M.o.U. on *reimbursable* launchings, the first such agreement concluded by NASA in deviation of its 'no exchange of funds' policy.[22]

19. On September 29, 1962 the first Canadian satellite Alouette 1, was launched from Vandenberg Air Force Base by a Thor-Agena rocket, followed by, a.o., the second British Ariel launch on March 27, 1964 (by a Scout from Wallops Island, US East Coast), the Italian San Marco on December 15, 1964 (also by Scout from the same base), and a French scientific satellite on December 6, 1965 (by Scout from Vandenberg AF Base). In an interesting reversal of roles the French in 1963 accepted NASA experiments to be flown on French sounding rockets: the launchings took place in 1964 from a French base in the Algerian Sahara and involved two Dragon and two Centaure rockets supplied by CNES, the French Space Agency. See *ibid.* The following year, the French launched their own satellite, Asterix 1, thus becoming the third 'space country' after the Soviet Union and the USA.
20. See, for history of ESRO and ELDO, *infra* Chapter 4.
21. Para. 9 of the M.o.U. provided that "ESRO and NASA will exchange all scientific information resulting from this cooperative program and make the results freely available to the world scientific community." For the full text of the M.o.U, see ESA HSR-14, *supra* note 16, at 41-43.
22. *Memorandum of Understanding between the European Space Research Organisation and the National Aeronautics and Space Administration concerning the furnishing of satellite launching and associated services* of December 30, 1966, reproduced as ESRO/C/198, rev.1 of 6 January 1967 in ESA HSR-14, *supra* note 16, at 45-51; see also NASA News Release No 66-332 of January 4, 1967. NASA News Release 67-48 of March 8, 1967 refers to six previous launches of foreign satellites conducted by NASA under cooperative agreements with no exchange of funds. As noted in ESA HSR-14, at 13-14, this new 'buyer-seller' -relationship did not diminish NASA's insistence on 'automatic' full and free access to all

The M.o.U. provided that ESRO would furnish flight-ready scientific spacecraft and that NASA would provide the launch vehicle, range and launching facilities and other support. The M.o.U. provided further that ESRO would pay NASA for the launch vehicles and for all identifiable direct costs of equipment and services furnished by or through NASA, plus certain indirect costs agreed upon. Separate contracts, setting forth detailed arrangements and the responsibilities of the agencies involved, would be drawn up for each proposed launching.
The first such contract concerned the 1968 launch from Cape Kennedy, by Delta launch vehicle, of ESRO's HEOS-A scientific satellite for an estimated USD 4 million.[23]

The Soviet Union began to make overtures to Europe in the field of space research cooperation. These overtures were taken up by France, which, under President de Gaulle, had put a great deal of energy into an independent security policy, including the development of nuclear weapons and delivery systems.[24] Perhaps in response to this Soviet initiative the U.S. and a number of European countries, in the period 1965-1967, held discussions on the question of the space technology gap and the type of cooperation that could assist Europe in catching up with the Americans.
President Johnson personally supported this idea, as such cooperation would contribute to closer overall (including economic and security) ties between the U.S. and Europe.
The original plan was to limit this cooperation to the field of spacecraft development and space exploration, an approach perceived by the Europeans not as a help to foster space development, but as a way to "divert Europe from the essential economic benefits to be derived from space through the exploration of communications satellites."[25] This perception was not without foundation as the U.S. offer resulted from a rather restrictive policy, approved by the U.S. president in 1965, concerning assistance in the development of

data obtained by the satellites, a demand ESRO was not prepared to meet, *inter alia* to safeguard intellectual property right of the Organization and its researchers. As NASA was required to be able to answer any Congressional question with respect to the data "acquired by any satellite launched from United States' territory" a compromise was reached which obliged ESRO to provide NASA with the satellite data, "upon NASA's request and at NASA's expense", while use of such data would be subject to prior permission of ESRO and subject to its rules relating to intellectual property rights, see art. IV of the M.o.U., at 51. One can safely assume that the experience with these American demands strengthened the position of those ESRO members who sought to establish an independent European launch capability.

23. See NASA News Release 67-48 of March 8, 1967.
24. The French withdrawal from NATO in 1966 and its first nuclear ballistic missile tests in 1967 showed an independence of thinking which was worrysome to the U.S. government, see ESA HSR-18, *supra* note 7, at 10.
25. See ESA HSR-18, *supra* note 7, at 16.

foreign communications satellite capabilities. The three principles which formed the core of that policy were the following:

"The United States should refrain from providing direct assistance to other countries which would significantly promote, stimulate or encourage proliferation of communications satellite systems.
The United States should not consider requests for launch services or other assistance in the development of communications satellites ... for commercial purposes except for use in connection with the single global system established under the 1964 Agreements ...
All transactions involving technological assistance on satellites or launcher technology "should be conditioned upon express written assurances "by the foreign nation(s) that the technology and assistance obtained would be used only within framework of Intelsat and arrangements to which the US was participant and should not be transmitted to third countries prior to US authorization."[26]

For the above reasons, ESRO declined the above proposal (the project would eventually become the subject of U.S. - German cooperation).

European unhappiness with this hegemonistic approach taken by the U.S. coincided with realization on the U.S. side that it was in their strategic and economic interest to have more or less 'equal partners' in Europe. Also, the U.S. was concerned with the threat of national proliferation of civilian and (more difficult to detect) military (read: French) launchers if ELDO was not assisted with its launcher program and the rigid approach of the communications satellites policy was maintained. Additionally, the U.S. authorities were aware of a joint Franco-German communications satellite programme, Symphonie, conceived for the purpose of obtaining know-how (and a better negotiating position within Intelsat) in this field, and "to test, as it did, American willingness to launch European commercial satellites."[27]
There was in fact every reason for the U.S. to believe that continued 'obstructionism' on their part would lead to an uncontrolled development of competitive space capabilities (on top of exacerbating U.S. - European relations).[28]

26. *Policy concerning US assistance in the development of foreign communications satellite capabilities*, National Security Action Memorandum (NSAM) 338 of September 1965, *id.*
27. *Id.*
28. NASA administrator Webb expressed the view that "neither communication spacecraft development ..., ELDO launch vehicle development, nor the Guyana [European equatorial launch] range can any longer be delayed by US export restrictions. By the completion of the range in 1969-70, the European nations could, if they wish, be in a position to place in synchronous orbit an operable comsat spacecraft.", remarks quoted in ESA HSR-18, *supra* note 7, at 18. Thus, according to the American Ambassador in France, the US government would have more to gain in the role of a helpful partner vis-à-vis France and Europe than as a stern competitor, *id.* at 18-19.

The U.S. dilemma was, then, to assist Europe sufficiently so as not to antagonize and loose (control over) their 'ally', without being so efficient or generous that it would turn Europe into a serious (commercial) competitor in the field of the manufacture, launch and operation of communications satellites, to the possible detriment of the Intelsat/Comsat 'single global system'. Moreover, too little or too much help could also turn Europe, and France in particular, into an independent nuclear delivery system owner/operator, a serious non-proliferation worry of the U.S.
Hence a series of decisions and policies on the part of the U.S. with varying emphases depending on the fear of the day or the (lobbying) strengths of the Departments and industries concerned.

In 1966, a Presidential Directive called for positive support of, and assistance to, ELDO, subject to the condition that the launcher vehicles, components and technology provided by the U.S. should not be used:

"1. for improving communication satellite capability other than a. To permit participation in the National Defense Communication Satellite System; b. In accordance with the Intelsat agreements regulating (civilian) telecommunication satellite policy,
2. for improving nuclear missile delivery capability,
3. for transmittal to third countries."[29]

In accordance with this Directive, the U.S. offered both hardware (components and launchers) and know-how to ELDO, and also joint development of a new upper stage. Some useful and informative discussions between NASA and ELDO experts were the short term result.

A revised U.S. NSAM 338 saw the light in July 1967. The most important change was to be found in the spirit of the new Memorandum. Where originally the U.S. position was based on development and protection of one single global communications satellite system, the new text reflected American acceptance of the inevitability of the development of new regional systems, and attempted to guarantee an integration or at least an association of these new systems with Intelsat: if you can't beat them, have them join (and conform).[30]

Here, a crucial provision kept the parties apart for a considerable length of time. Draft article XIV of the agreement created the possibility in principle to set up a regional satellite system separate from Intelsat provided technical compatibility with the Intelsat space segment was ensured and significant

29. *US cooperation with the European Launcher Organization ELDO*, National Security Action Memorandum (NSAM) 354, ESA HSR-18, *supra* note 7, at 19-20.
30. An 'accommodative' attitude would also support the continuity of Intelsat at the 1969 negotiations; as a NASA paper put it, "The health of Intelsat is assured in part by the feeling of the major Intelsat partners that they are indeed partners and not puppets in an organization dominated by the US.", see ESA HSR-18, *supra* note 7, at 22.

economic harm to the latter system was avoided.It was up to the highest organ of the organization, the Assembly of Parties, to express its findings on that issue in the form of recommendations.
The U.S. position on the majority needed to have a satellite (system) approved by the Assembly would determine Europe's fate as to U.S. launcher availability for its satellites. Clarity thereon was not easily obtained. Where originally, in U.S. thinking, a two thirds vote against the satellite was required to defeat it (and Comsat in the new set up had lost its veto power), in 1971 the U.S. position was that two thirds of the votes was necesssary to get a satellite system *approved*.[31] The fact that the U.S. was prepared to give advance indications of its voting behaviour within Intelsat on specific, well-defined European system proposals, was hardly a consolation: its qualified support, depending on the number of countries in the geographical area covered by the proposed system, and thus on the competitive reach of the system, was another demonstration of the grip the U.S. had on - future - European space telecommunications through its launch monopoly.[32]
In 1971 the 77 Intelsat parties came to a final agreement on the governance of the new permanent organization. And in January 1972 President Nixon announced his decision to develop the space shuttle. His administration's inclination to please or appease the Europeans with a liberal launch policy was, for various reasons, limited. (One reason, apart from a change in political priorities of his administration, may have been the fact that the French had continued to vigorously develop and test the main elements of their 'force de frappe' and were not to be distracted from their goal of nuclear missile independence: the American non-proliferation goal of US-European space cooperation had apparently not been attained)

A new "United States Policy governing the provision of launch assistance", addressed to interested countries and international organizations, was promulgated on October 9, 1972. It confirmed the restrictive, Intelsat monopoly-oriented character of the U.S. views and basically told Europe to accept U.S. conditions or look for launch vehicles elsewhere:

31. See letter from Johnson, Under-Secretary of State, of Februari 5, 1971, reprinted in ESA HSR-18, *supra* note 7, Annexes. The US position had apparently hardened both because of pressure from Comsat and the aerospace industry which had benefitted greatly - in terms of contracts received from Intelsat - from the old Comsat-oriented voting-system. Moreover, a new Office of Telecommunication Policy reporting directly to the President had been very critical of "attempts by NASA and the State Department to endanger US monopoly in telecommunication satellites on the base of uncertain political returns,", *id.* at 25.
32. As Belgian minister Lefevre on behalf of the European countries concerned noted, with some bitterness, in his response to Johnson: "To sum up, we are obliged to note that, although the present state of the discussions offers some prospect of our launching our immediate projects within the framework of our collaboration in the post-Apollo programme, it does not enable us to embark on any medium or long-term programming of our space activities." *id.*, Annexes).

"With respect to satellites intended to provide international public telecommunications services: 1. [t]he United States will provide appropriate launch assistance for those satellite systems on which Intelsat makes a favorable recommendation in accordance with Article XIV of its definitive arrangements ..."[33]

Other aspects of the launch policy covered conditions with respect to the place of launch. Where a U.S launch site was envisaged, the arrangement would involve the acquisition of U.S. launch services on a cooperative or reimbursable basis; in the latter case European users would be charged on the same basis as comparable non-U.S. Government domestic users. And with respect to the priority and scheduling for launching European payloads, the U.S. would deal with these launchings "on the same basis as our own".
In the case of preference for the use of foreign launch sites, the arrangements called for the purchase of a U.S. launch vehicle only and the assurance on the part of the buyer that the launch vehicle would not be made available to third parties without prior agreement of the U.S. Launch assistance would in all cases be subject to U.S. laws, which included export control regulations.[34] Nothing in the text of the launch policy, although promulgated at a time when the space shuttle was only on the drawing board, prevented it from being equally applicable to the provision of shuttle launch services to foreign countries, though only with respect to launches from U.S. territory.

It must be assumed that the European space authorities were less than impressed by the text accompanying this launch assurance policy:

"In establishing today a global launch assurance policy, the President affirms the need for a dependable capability which would make it possible for nations to have access under equal conditions to the advantages which accrue through space applications" (emph. add.).[35]

The fact is that they saw the policy as reaffirming the *de facto* binding character of Intelsat (article XIV) recommendations, in conformity with the U.S. views on the matter. In the same vain, the launch of Symphonie could only be agreed upon (in 1974), subject to confirmation that the project would be of an experimental nature only. The possibility to transform it into an operational system was included in the agreement, but again subject to the above Intelsat-related conditions. The Symphonie-Directors had no choice but to grudgingly accept.[36] As we will see in Chapter 4 the above experience with

33. See, the White House Fact Sheet of above title and date, reproduced in ESA HSR-18, *supra* note 7, Annexes; also in US Dept of State Bull, Nov 6, 1972, at 533-534).
34. See *ibid.*
35. See *ibid.*
36. *Launching of French-German Symphonie Communications Satellites*, Agreement effected by exchange of notes, signed at Washington June 21 and 24, 1974; e.i.f. June 24, 1974, see *ibid.* (Annexes); the alternative, a launch provided by the Soviet Union, was in principle available but not within the planned timeframe, see *id.*, at 28.

U.S. launch policies created a definite need on the part of Europe 'to go-it-alone'.

2.1.1.3 The decision to develop the space shuttle

Nixon's decision, in 1972, to proceed with the development of the shuttle was preceded by 3 years of not only dramatic moon-landings but also political debate in both the administration and Congress about possible programs for the period after the completion of the Apollo program. Where both NASA and -posthumously- President Kennedy got well-deserved praise for this inspiring and highly successful venture, it was again NASA and the new president who, for different reasons, needed a new project of equally dramatic proportions. The geo-political situation was of course quite different from the one in which Kennedy could take his historical decision. The cold war plus the perceived threat of Soviet military-strategic dominance in space had been replaced by a much milder and less antagonistic atmosphere: after all, U.S. superiority in space exploration had been established, the crisis was over, the race had been won. How then to fire the imagination of people (and make them pay the bill)?

In 1963 the officials in the Kennedy administration had begun to consider possible programs to be undertaken by NASA after the completion of Apollo. Under his successor Johnson, NASA was asked to identify future objectives for the civilian space program. NASA's study, reported in January 1965, provided an overview of the capabilities it was developing and the uses to which these might be applied, but, in the absence of clear political support for any specific direction, did not (dare to) identify any single area of space development "which appears to require an overriding emphasis or a crash effort".[37]

When Nixon first took office in January 1969 he appointed a Space Task Group to study post-Apollo plans and make recommendations. Strongly influenced by NASA, the Group's report of September 1969 (the Eagle had landed in the meantime!) included a manned orbital space station and, to support the station and its subsequent additions, an efficient, low-cost and flexible 'airline-type' earth-to-orbit transportation system, the shuttle. A key element of the system was its reusability.[38]

Studies conducted by NASA in the mid-sixties had found that reusable space transport was technically feasible and could yield a substantial reduction in operations cost. And it would certainly be more cost effective than the use of large expendable vehicles like the Saturn. (Some NASA officials compared the

37. See Launius, *supra* note 1, at 197.
38. See, *id.*

methods of launching into orbit used on project Apollo to operating a railroad and throwing away the locomotive after every trip!).[39]

The administration's decision, for budgetary reasons, to terminate the Saturn V heavy lift booster production line in mid-1968 made the shuttle the only hope for continuation of human (American) presence in space.
And the shuttle - in NASA's plan - would be flexible enough to provide all orbital services required by users, including the transportation of scientific and applications satellites.

With the support of Nixon, NASA administrator Paine, in 1969, tried to get foreign partners interested in this Post-Apollo programme. Only Europe was interested, particularly in another part of the project, the space 'tug', a vehicle that was to transfer payloads from the shuttle's orbit into higher orbits. Development of the tug and cooperation in the development of the shuttle would provide Europe with interesting and useful know-how on propulsion and transport technology.[40] However both internal disagreement on the preferred European course and, partly as a consequence, complicated discussions with the Americans on the exact contents and cost of the participation and the extent of the transfer of know-how, made a firm agreement difficult to reach. In 1971, with the Nixon administration, the American attitude had changed from a cooperative into a 'go-it-alone' mood. They found the Europeans too demanding and the programme, which had been under attack, *inter alia* for budgetary reasons, had been reduced in size and scope. The above question of availability of launchers and/or transfer of launcher technology did not improve the cooperative atmosphere. Moreover Nixon had priorities other than strengthening space cooperation with Europe, *i.e.* a special relationship, including space cooperation, with the Soviet Union. In 1972, a State Department official informed the European space authorities that both the space shuttle and the 'tug' had been withdrawn as candidates for cooperation, and that "Europe's further involvement in the post-Apollo program was not of any commercial or technical importance to his government".[41]

A memo of NASA administrator Fletcher to President Nixon in November 1971 listed the following reasons for approving shuttle development:
- the U.S. cannot forego manned space flight
- the space shuttle is the only meaningful new manned space flight program that can be accomplished on a modest budget
- the space shuttle is a necessary next step for the practical use of space

39. See, *id.* at 107.
40. In fact, an internal European working group suggested that the tug become the"essential nucleus of European participation", see ESA SP-1172, *supra* note 4, at 88.
41. *Id.*, at 89; some of the unofficial reasons, apart from "European indecisiveness", were doubts that Europe's industry was up to the task, reluctance to transfer sensitive technology and US military interest in taking control over the tug, see *ibid.*

- the cost of today's shuttle is about one-half of what it was six months ago (*i.e.* USD 5.5 billion in stead of the original 10-15 billion)
- starting the shuttle now will have a significant positive effect on aerospace employment. Not starting would be a serious blow to both the morale and health of the [U.S.] Aerospace Industry.[42]

Which of the above justifications prompted Nixon to give the project his go-ahead is not certain. One author mentions his fascination with astronauts and the fact that the bulk of the space shuttle's contract work would go to his home state of California.[43] NASA historian Launius mentions a memo written by Casper Weinberger, then Deputy Director of the Office of Management and Budget, to the president, in which he described a reduction of the NASA budget as confirming a "belief gaining credence at home and abroad: [t]hat our best years are behind us, that we are ... voluntarily starting to give up our super power status, and our desire to maintain world superiority."[44] The above justifications, Weinberger's views and the desire to start a new aerospace program that would avoid unemployment in critical states in the 1972 election year "ultimately proved decisive", according to Launius. And, to the extent one subscribes to the guidelines as to the motivations of a president when deciding on matters of policy as provided by another author (*i.e.* any president's three major goals are reelection, good policy, and historical achievement),[45] the shuttle could certainly also satisfy the latter of the three presidential goals.

On January 5, 1972, President Nixon announced his decision "that the United States should proceed at once with the development of an entirely new type of space transportation system designed to help transform the space frontier of the 1970s into familiar territory, easily accessible for human endeavor in the 1980s and 90s ... It will revolutionize transportation into near space, by routinizing it."[46]

NASA's plan originally had been to build a fully reusable omni-purpose space truck *cum* laboratory capable of performing all possible space transportation tasks for the government and for commercial purposes. A large fleet of those shuttles would conduct an estimated 50-60 flights per year. As we saw, NASA estimated development costs at approximately USD 15 billion over 10 years.[47]

42. Launius, *supra* note 1, at 109-110.
43. See James A. Vedda, *Evolution of executive branch space policy making*, 12 (3) Space Policy 177-192 (1996) hereinafter referred to as Vedda, at 179.
44. Launius, *supra* note 1, at 109.
45. Paul C. Light, *The President's Agenda*, USA (1983), as quoted by Vedda, *supra* note 43, at 177.
46. See The White House, Statement by the President, 5 January 1972, reprinted in Launius, *supra* note 1, at 232.
47. See Vedda, *supra* note 43, at 181.

In the absence of an inspiring cause or national security threat however, the political mood was one of spending less on space and demanding more in return. An additional handicap was that the Defense Department, though having some military uses in mind, saw the shuttle more as a convenience than as an essential system.[48] Nevertheless, in order to get both the White House and Congressional approval to develop the shuttle, a DOD commitment to use the system for all its launches was essential. For that purpose the vehicle had to meet all possible DOD requirements, which made it heavier, more complicated and more costly.

Thus, NASA was forced to go back to the drawing board and, *nolens volens* assisted by a critical Office of Management and Budget, had to review a number of alternatives to its original design. The project finally chosen in 1972, consisting of a total of 5 partially reusable shuttles, had to be completed by the end of the seventies at a cost of not more than USD 5.5 billion.[49]
And, more important for our discussion, the shuttle had to pay its way by showing economic returns, "the first time the space agency had been subjected to cost-effectiveness criteria in one of its programs."[50]
That requirement could only be met by giving the shuttle a space transport monopoly at the expense of the existing expendable launch vehicle fleet. That monopoly, in turn, to be effective, had to include all military and intelligence payloads, calculated at about one-third of all future space traffic. The Air Force, at first, was adamant in its view that it would have to continue to develop and purchase its own expendable (Titan and Atlas) boosters, and would only contribute to the cost of the shuttle by building a launch complex at Vandenberg Air Force Base. In 1971 they finally agreed not to develop any new boosters, although they would continue to purchase existing designs.[51]
So NASA, in the end, was committed to both cut the cost of shuttle operation, use the shuttle for all governmental and commercial payloads, and eliminate the (use of the) entire fleet of U.S. expendable launch vehicles.

Although, for many years to come, nothing would change in practice (as it took a long time before the shuttle became operational), there is no doubt that, given the specialized technology, high cost and long lead times associated with the manufacture of (new) launch vehicles, this policy proved to be a serious and -in the long run- costly setback for the ELV industry's research and development efforts. After all, there is hardly shareholders value in investing

48. *Id.*, at 180.
49. *Id.*, at 181.
50. *Ibid.* This requirement also influenced the technical specifications; as Vedda observes "[i]f the objective was manned orbital flight with a reusable spacecraft, then the technical path was clear, but if the objective included low cost access to orbit, economic payback, and a high flight rate, then the technical approach was not so well defined." *id.*, at 180.
51. See Dennis R. Jenkins, *Space Shuttle - The history of developing the national space transportation system*, USA (1996) hereinafter referred to as Space Shuttle 1996, at 75.

in new technology if there are officially no future launch needs to be met and thus no profits to be made therewith.

In the years after the shuttle decision, the U.S. ELV and missile industry continued to produce large numbers of launch vehicles and missiles for both civil (NASA) and military (DOD) needs respectively, though - understandably - space shuttle related procurement by NASA would increase more impressively through the years: from 1973 to 1976 the latter figures would increase rapidly from USD 199 million (1973) and USD 475 million (1974) to USD 797 million in 1975 and approximately USD 1,2 billion in 1976.[52] The original shuttle development planning foresaw a phasing in of the shuttle (and a phasing out of the ELV's) in 1977 or 1978. As it turned out, technical and financial problems delayed the first launch until 1981, and it wasnot until July 1982 that the shuttle was declared operational.[53]
In the mean time, obviously, the U.S. government (NASA) could not discontinue the expendable option. NASA's launch vehicles in the 1970s therefore continued to be the Atlas and Delta, for the launch of commercial or scientific satellites into geostationary orbit, and the Scout for smaller payloads destined for lower earth orbits, whereas the Titan would remain the launch vehicle preferred by DOD for military payloads; and U.S. industry continued to keep their assembly lines running for their valued customers.[54]
But with his Presidential Directive of 1978, Carter had reconfirmed the role the shuttle was going to play in meeting the space transportation needs of the U.S.:

"The United States will develop, manage, and operate a fully operational Space Transportation System (STS) through NASA, in cooperation with the Department of Defense. The STS will service all authorized space users - domestic and foreign commercial and governmental - and will provide launch priority and necessary security to national

52. In the same years NASA's launch vehicle (ELV) procurement would, in USD millions, amount to 221, 178, 140 and 166 respectively, whereas DOD procured missiles for the following amounts: USD 3.023 million (1973), 2.981 (1974) and 2.889 (1975). Overall sales of space vehicle systems, incl. engines and propulsion units, by the US aerospace industry to US and foreign customers amounted to:
1973: USD 2.117 million (military 1.509, non-mil. 608), 1974: USD 2.402 (military 1.577, non-mil. 825), and 1975: 2.812 (military 1.766, non-mil. 1.046), see Aerospace Facts and Figures 1974/75 (23d ed.) and 1975/76 (24th ed.), Aerospace Industries Association of America Inc. AIA(A), Washington D.C., *passim*. It should be noted that both in 1974 (with a double-digit inflation percentage) and in 1975 (less inflation and a better economy) the above - latter - figures, if adjusted for inflation, saw an actual decrease in constant dollar sales in 1974 and at most a *status quo* in 1975, see Foreword President AIA in both issues.
53. On the occasion of the return to earth of Space Shuttle Columbia, on July 4, 1982 (the fourth flight of the shuttle), President Reagan declared the US Space Transportation System (STS) operational.
54. For NASA civil space programs executed in the 1970s, see Launius, *supra* note 1, at Ch. 9, *passim*.

security missions while recognizing the essentially open character of the civil space program."[55]

2.2 The commercialization of expendable launch vehicles in the 1980's

2.2.1 ELV regulation prior to the Commercial Space Launch Act

When, on July 4, 1982, President Reagan finally declared the shuttle operational, he also announced an updated U.S. Space Policy. Apart from addressing all other aspects of U.S. civil and military space activities and advocating a strong private sector involvement and investment in U.S. space programs, it re-confirmed the status of the shuttle as the future "primary space launch system", and added a number of requirements for the shuttle system which would effectively end the dominance of the ELV's:

"-... The first priority of the STS program is to make the system fully operational and cost-effective in providing routine access to space ...
-United States Government spacecraft should be designed to take advantage of the unique capabilities of the STS. The completion of transition to the shuttle should occur as expeditiously as practical.
-NASA will assure the shuttle's utility to the civil users. In coordination with NASA, the DOD will assure the shuttle's utility to national defense and integrate national security missions into the shuttle system. Launch priority will be provided for national security missions.
-Expendable launch vehicle operations will be continued by the United States government until the capabilities of the STS are sufficient to meet its needs and obligations. Unique national security considerations may dictate developing special-purpose launch capabilities."[56]

Although the above text still left some time and opportunities for the established ELV manufacturers to sell their products,[57] competition with the space shuttle was already a fact, and the requirement for government spacecraft to be made fit for shuttle launch would seriously affect any future possibility

55. See *Civil and Further National Space Policy*, Presidential Directive/ NSC-42 of October 10, 1978, White House Press Release (Description of a Presidential Directive on national space policy), The White House, June 20, 1978, reprinted in S. Gorove, *United States Space Law, national & international regulation*, hereinafter referred to as Gorove US Space Law, at national regulation, I.A.4 (1989).The Fact Sheet of October 11, 1978 accompanying the above press release, added a.o. that "[o]ur space policy will reflect a balanced strategy of applications, science and technology development containing essential key elements that will: ... [t]ake advantage of the flexibility of the Space Shuttle to reduce the cost of operating in space over the next two decades to meet national needs." ...
56. National Space Policy, Presidential Directive/NSC-42, 18 Weekly Comp.Pres.Docs 894-898 (1982).
57. NASA funding for ELV's would cease at the end of fiscal year 1984.

for ELV's to be a viable alternative for shuttle launches in that highly lucrative and stable market. Hence a "fury of activity in the aerospace community", as one author describes their reaction, aimed at keeping the assembly line and the launch orders coming.[58] At the same time, and separate from the efforts of the established aerospace industry to maintain its position of launch vehicle provider to NASA and DOD, numerous smaller aerospace firms showed interest in establishing private commercial ELV operations by obtaining the right from these manufacturers to market their products to the satellite customers in lieu of NASA.[59]

This clear interest on the part of the U.S. private sector to venture into the risky business of selling ELV services (and developing new vehicles) had already led to applications on the part of some companies for government approval of intended private launches. One of these start up companies was Space Services Inc (SSI). The processing of its applications showed clearly that the government was not yet prepared for these private space launch activities. Federal regulation dealing with the matter was absent or at best scattered through the various regulatory agencies. Thus, when SSI, a Texas corporation run by ex-NASA astronaut 'Deke' Slayton, in 1981 sought approval for the test-launch - from its own launching facilities - of a liquid-fuelled Percheron rocket, it approached not only the Federal Aviation Administration (FAA), the State Department (State), NASA and the Federal Communications Commission (FCC), but had to submit its plans to more than 15 other federal agencies as well (such as DOD, Air Force, Navy and Coast Guard, the Bureau of Alcohol, Tobacco and Firearms and the Internal Revenue Service to name a few).[60]

58. See Nathan C. Goldman, *Space Commerce - free enterprise on the high frontier*, USA (1985), hereinafter referred to as Goldman Space Commerce, at 41; the author refers to the announcement by the NASA Associate Administrator for Space Flight, General Abrahamson, in late 1982, to phase out the expendables, "because the refitting of a satellite for launch on an expendable was more expensive and time-consuming than waiting for the next available shuttle flight", as setting off this fury of activity.
59. See *id.*, at 44; also Grier C. Raclin, *Going to work in space: a survey of presently available launch systems* in: American enterprise, the law and the commercial use of space 30-72,USA (1986) hereinafter referred to as Raclin, at 53.
60. See Raclin, *supra* note 59, at note 91; for the regulatory approval of its second launch, the solid-fuel rocket 'Conestoga 1', SSI spent over 6 months of efforts and $250,000, see *ibid.* As SSI sought to import rockets from West Germany for use in calibrating its radar, it required a license for importation of firearms from the above Bureau! See E. Jason Steptoe, *United States government licensing of commercial space activities by private enterprise*, Proceed. 27th Coll.L.Outer Space 191-196 (1984) hereinafter referred to as Steptoe 1984, at 193. Also Webber 1984, *supra* note 13, quoting statements made in a Congressional hearing on the subject, "... various government agencies with relevant interests to protect have interjected a hodgepodge of uncoordinated licenses and legal requirements that make private launchings a procedural nightmare.", at 5.

The FAA's authority was based on the Federal Aviation Act of 1958 and its implementing regulations, the Federal Aviation Regulations (FAR's).[61] In 1981, the only FAR's found applicable were contained in Part 101, sub-part C, dealing with 'unmanned rockets', and adopted in 1963 to ensure that small rockets launched by hobbyists and scientists would not endanger air traffic.[62] Sub-part C did not apply to rockets operated within restricted areas, such as the government launch bases, where NASA or DOD would be the responsible agencies supervising the launch.[63]
The main provision making an FAA waiver necessary read as follows: "No person may operate an unmanned rocket ... (b) in controlled airspace ..."[64] A launch from U.S. territory would invariable involve entry into such air space, so ISS requested and obtained a waiver from this prohibition, though, in order to avoid additional regulatory complications, limited to a launch within U.S. territorial waters. The launch failed. ISS' second launch, of the 'Conestoga 1' rocket, took place one year later and involved similar administrative processes. It also received launch clearance from the FAA and the other agencies involved. The additional complication to be dealt with was the fact that the launch would involve a 'splash-down' in the international waters of the Gulf of Mexico thus turning it into an 'export' involving State Department licensing procedures.[65] With this latter - successful - launch, SSI would become the first American company launching a rocket into space.

Among the agencies playing a role in the licensing were, as indicated above, NASA, FCC and DOD.[66]
NASA disclaimed any regulatory authority for these private commercial space activities. However, as the only expert in this field they were asked by the FAA and the other agencies involved to review all aspects concerning the technical safety of the launches. In the Conestoga case this was the more appropriate as NASA provided the Minuteman rocket engine used by the Conestoga.[67]

61. See 49 USC paras 1341-1359 and 14 CFR parts 1-99 respectively.
62. Reprinted in Gorove US Space Law, *supra* note 55, at I.A.3. The FAA, when granting permission for the launch did not refer to any other regulations, see James R. Myers, *Federal government regulation of commercial operations using expendable launch vehicles*, 12 (1) J. Space L. 40-51 (1984), hereinafter referred to as Myers 1984, at 43-44. The author further notes that Part 101, sub-part C was not designed to regulate commercial sub-orbital and orbital rocket launches.
63. The FAA did not have jurisdiction over ELV's used by NASA or DOD because 'public aircraft' were exempted from its regulatory powers; the FAA also exempted the space shuttle from the coverage of the Act, see Webber 1984, *supra* note 13, at 9, 10).
64. Part 101.23; additionally, Part 101.25 specifies the information to be given to the nearest FAA Air Traffic Control Facility.
65. See Chapter 2.3.1. *infra*.
66. For a more detailed account of the administrative process SSI was subjected to, see Webber 1984, *supra* note 13.
67. See Myers 1984, *supra* note 62, at 46.

The FCC's federally mandated role in all communications issues made the agency responsible for frequency-licensing. ISS requested - and received - an experimental radio license granting the right to use frequencies for its tracking and control communications with the rocket.

DOD, through the U.S. Air Force, would monitor the national security aspects of private launches. In the ISS case they were also involved in the safety aspect of possible collisions with other orbiting satellites; for that purpose, NORAD/Space Command made the necessary calculations of available and used orbits before clearing the launch in that respect.[68]

In the absence of an agency with a clear mandate for licensing all aspects of private launches, companies had no choice but to go through the above cumbersome, labour-intensive and expensive multi-agency approval process, with all the concomitant uncertainties. And pressure grew within the government to have a more professional licensing process and a specific agency taking care of all licensing aspects. This made sense where the 1982 National Space Policy had clearly opted for a strong private sector involvement, which in turn required such governmental regulations and procedures as would actually promote the active participation of U.S. enterpreneurs in the exploitation of space. The above space policy directive had also created the *Senior Inter-agency Group on Space* (SIG-Space) to implement its policies and principles.[69] And SIG-Space, as one of its agenda items, addressed the issues of the phasing out of governmental ELV operations and of both an increasing private sector interest in continuing these ELV systems and the emergence of new enterprises, established with the express purpose of developing commercial space launch capabilities, all this in the light of the absence of adequate regulation of such private operations. The 4-month interagency study concluded that a viable commercial ELV industry would add to the general economic vitality of the U.S. and provide the U.S. with a more robust space launch capability. More specifically, the following economic benefits were identified:

- a commercial ELV industry would maintain a high technology industrial base
- it would provide jobs for thousands of workers (and increase federal and state tax revenues!)

68. *Id.* at 50.

69. SIG (Space) was chaired by the Assistant to the President for Security Affairs; other members included the Deputy Secretaries of Defense, Commerce and State, Director of the CIA, Chairman of the Joint Chiefs of Staff, Director of the Arms Control and Disarmament Agency, the NASA Administrator and others. Its task was to provide a forum to all federal agencies for their policy views, to review and advise on proposed changes to national space policy, and to provide for orderly and rapid referral of space issues to the President for decisions as necessary, see Remarks on the completion of the Fourth mission of the Space Shuttle Columbia, 18 Weekly Comp. Pres. Doc. 869-875 (1982) Note the strong representation of national security interests).

- "each commercial launch conducted in the U.S., *rather than by foreign competitors*, would strengthen our economy and improve our international balance of payments." (emph. add.)
- it would spawn numerous spinoffs and supporting activities and strenghten the U.S. position in a growing market.

In addition to these general economic benefits, the study saw the advantages for both NASA and DOD of having a domestic backup for the shuttle at essentially no extra cost for the government.
Not only would the private sector bear the cost of ELV production, but there would also be a market for U.S. government facilities and equipment that would otherwise be underutilized or no longer required. In summary, the report said, this partnership between the U.S. private sector and the government "will strengthen the U.S. space launch capability, develop a major new industry, contribute favorably to the U.S. economy and maintain U.S. leadership in space transportation."[70]

The result was a recommendation which found its way into a Presidential *Directive on Commercialization of Expendable Launch Vehicles*, of May 26 1983, initiating a (transition-) period of uneasy competition between the infant private commercial launch industry's ELV's and NASA's space shuttle. The U.S. government fully endorsed and would facilitate the commercialization of ELV's through various measures, such as minimal regulatory constraints, and the availability of government launch ranges, facilities and services at prices "consistent with the goal of encouraging viable commercial ELV launch activities". The U.S. government would continue to make the space shuttle available for all authorized users, domestic and foreign, commercial and governmental.[71] In other words, the government would henceforth support two competing U.S. systems, one of which (see above emphasis) was also supposed to take on Arianespace, the European competitor which, in 1983, though having performed a limited number of successful launches, was seen as qualified and determined to firmly establish itself in the international commercial launch market.[72] The Directive also established a 'working group on commercial launch operations' within SIG (Space), including the FAA and FCC, with the task to (a) streamline the procedures used in the interim to implement existing licensing authority (b)develop and coordinate the requirements and process for the licensing, supervision, and/or regulations applicable to routine commercial launch operations from commercial ranges, and (c) recommend the appropriate lead agency within the U.S. government to be responsible for commercial launch activities. (Until final selection of the

70. See *Commercialization of expendable launch vehicles*, NSDD 94, Announcement of United States government support for private sector commercial operations of expendable launch vehicles (May 16, 1983) 19 Weekly Comp. Pres. Doc. 712-714, (721-722) hereinafter referred to as ELV Commercialization Directive, at 714 ('Background').
71. See *id.*, at 712.
72. See *infra* Chapter 3.4.

latter, the State Department would serve as the focal point for all relevant requests and applications).[73] After, what some commentators call "extensive and intense lobbying by interest groups in the private sector, by the Congress, and by the Administration itself",[74] President Reagan, in November 1983, chose the Department of Transportation and not its main competitor the Department of Commerce as the lead agency.[75]

DOT Secretary Dole acted swiftly and, in the same month, the *Office of Commercial Space Transportation* (OCST or the Office) established within the Office of the Secretary, started to carry out its new responsibilities. It could immediately assist *Starstruck Inc.*, another private operator, in getting permission for the launch of its prototype Dolphin rocket from a Pacific Ocean platform. Though the same plethora of departments and agencies were involved, now OCST provided Starstruck with the single governmental contact point SSI did not have; as a result, the regulatory process for the former proved far less cumbersome than the latter had to endure.[76] In his State of the Union address of January 25, 1984, which was primarily devoted to the announcement of the space station project, President Reagan directed DOT to assist providers of ELV services in their dealings with the Federal Government[77] and one month later, by Executive Order (E.O.), he formalized this new role of DOT and gave specific directions as to the (licensing) functions the Department would perform:

73. See ELV Commercialization Directive, *supra* note 70, at 713.
74. See George S. Robinson & Pamela L. Meredith, *Domestic commercialization of space: the current political atmosphere* in: American enterprise, the law and the commercial use of space 1-29 USA (1986) hereinafter referred to as Robinson & Meredith, at 3. For a review of some of the candidates, such as Commerce, FAA, State, NASA and DOD, see Webber 1984, *supra* note 13, at 46-50.
75. See *DOT will be lead agency for expendable launch vehicles in space*, Press release DOT 98-83 of November 17, 1983. Secretary of Transport Dole was quoted as stating that "the objective [was] to try to create an environment as regulation-free as safely possible for private companies to supply the '[ELV's]' ... getting government out of the way of America's innovators and entrepreneurs ... We don't want the progress of this growth industry to be handicapped by the regulatory restraints that have restricted other transportation industries." Dole, in her last sentence, obviously referred to air transport which had suffered domestically, until deregulation in the mid-1970's, and continued to suffer internationally under excessive government interference.
76. See Michael S. Straubel, *The Commercial Space Launch Act: The regulation of private space transportation*, 52 J. Air L. & Com. 941-969 (1987), hereinafter referred to as Straubel 1987, at 947; also Raclin, *supra* note 59, at 60-61, where the author notes that OCST, in its coordinating role, worked with the agencies that reviewed Starstruck's request to set priorities, coordinated their activities, and expedited the licensing process. "For example, when Starstruck encountered difficulties with local officials who objected to Starstruck's proposed method of transporting its vehicle to the launch site, OCST worked with the Materials Transportation Board and the U.S. Coast Guard to alleviate the concerns of these officials."
77. See 20 Weekly Comp. Pres. Doc. 61.

"... The Secretary of Transportation shall ... perform the following functions:
(a) act as a focal point within the Federal government for private sector space launch contacts related to commercial ELV operations;
(b) promote and encourage commercial ELV operations in the same manner that other private United States commercial enterprises are promoted by United States agencies;
(c) provide leadership in the establishment, within affected departments and agencies, of procedures that expedite the processing of private sector requests to obtain licenses necessary for commercial ELV launches and the establishment and operation of commercial launch ranges;
(d) consult with other affected agencies to promote consistent application of ELV licensing requirements for the private sector and assure fair and equitable treatment for all private sector applicants;
(e) serve as a single point of contact for collection and dissemination of documentation related to commercial ELV licensing applications;
(f) make recommendations to affected agencies and, as appropriate, to the President, concerning administrative measures to streamline Federal government procedures for licensing of commercial ELV activities;
(g) identify Federal statutes, treaties, regulations and policies, which may have an adverse impact on ELV commercialization efforts and recommend appropriate changed to affected agencies and, as appropriaten to the President; and
(h) conduct appropriate planning regarding long-term effects of Federal activities related to ELV commercialization."[78]

The powers thus granted to the DOT Secretary did not diminish or abrogate any statutory or operational authority exercised by other Federal agencies. So the FCC remained responsible for radio frequency assignments, DOD for national security and the State Department for foreign policy aspects, and NASA and USAF for the use of their launch ranges, where appropriate. But the agencies concerned were ordered to assist the DOT in carrying out its above tasks by providing information on their own regulatory actions in this field, by eliminating unnecessary regulation, by efficiently administering the remaining essential regulations and procedures, and by expeditiously handling their side of the licensing process.[79] According to its first Director the primary goal of OCST was to establish an efficient regulatory framework which addressed public safety needs as well as foreign policy and national

78. See Sec. 2, *Commercial Expendable Launch Vehicle Activities*, Executive Order 12465 of February 24, 1984, 49 FR 721, herinafter referred to as ELV Executive Order. In his remarks on signing the executive order, President Reagan declared that "[u]ntil today, private industries interested in ELV's have had to deal with 17 Government agancies. From now on, they'll only get in touch with the [DOT], and the Department will clear away what Secretary Dole has called "the thicket of clearances, licenses, and regulations that keep industrial space vehicles tethered to their pads." With Elizabeth and her team in charge, private enterprises interested in space won't see red tape; they'll see blue sky." 20 Weekly Comp. Pres. Doc. 263 (Feb. 24, 1984), reprinted in Gorove US Space Law, *supra* note 55.
79. See Sec. 4 of the ELV Executive Order, *supra* note 78.

security safeguards, while at the same time providing predictability for the industry without stifling it.
In fact, in the view of that official, the problem was not so much the coordination of the other agencies involved, but the almost complete absence of government processes designed to address the wide range of issues and unique needs of private sector ELV launches.[80]

To assist the DOT in the performance of it new responsibilities, the above Executive Order also established an interagency working group chaired by the Secretary of DOT and composed of representatives from the Departments of State, Defense, and Commerce, and the Federal Communications Commission and NASA. Apart from that working group the Department itself, in 1984, established the Commercial Space Transportation Advisory Committee, *COMSTAC*, to provide information, advice and recommendations to the Secretary on matters relating to all aspects of the commercialization of ELV's.[81]
COMSTAC's membership reflected the scope of its activities: its up to 25 members were appointed after consultations with government agencies, industry and business organizations, the scientific community and public interest groups. In practice, executives from the private launch industry and the satellite manufacturers as well as representatives of the financial and insurance community would provide the much-needed high level expert advice, both in the full committee and in specific working groups established later, such as the Technology and Innovation Working Group and the International Competition Working Group.[82]

80. See Steptoe 1984, *supra* note 60 at 194. The above 'official' position of DOT (not to be overly worried about its coordinating task amidst the multitude of government agencies and thus not to aim for a DOT role as a single regulatory agency implementing a single set of all-encompassing regulations) met with criticism as this advisory or at most coordinating and facilitating role would not decrease interdepartmental jealousies and conflicts, and would stand in the way of an effective "one stop shopping" procedure as envisaged by the Secretary, see Webber 1984, *supra* note 13, at 52-53.
81. To that end, COMSTAC was authorized to: "A.Undertake such information gathering activities as necessary to define issues for consideration by the Committee, develop positions on those issues, and communicate the Committee's position thereon to the Secretary of Transportation. B. Evaluate economic, technological, and institutional developments relating to commercial space transportation and communicate to the Secretary recommendations on promising new ideas and approaches for Federal policies and programs. C. Serve as a forum for the discussion of problems involving the relationship between industry activities and government requirements. Seek, where possible, to resolve such problems without resort to formal Departmental intervention", *Establishment of Commercial Space Transportation Advisory Committee*, Department of Transportation, Office of the Secretary, Notice No. 84-5, 49 FR 14621 (Apr 12, 1984).
82. One of the first chairmen of Comstac, for instance, was Steven D Dorfman, President & CEO, Hughes Space & Communications Company.

2.2.2 *The responsibilities of DOT under the Commercial Space Launch Act of 1984*

By January 1983 the U.S. Congress, and more specifically the House of Representatives' Committee on Science and Technology and its Subcommittee on Space Science and Applications, had shown a keen interest in an orderly commercialization of ELV's. Draft legislation introduced in that month provided for the designation of Commerce as the lead agency with the responsibility to issue commercial launch licenses and to oversee and promote such operations. Both the private sector interest at the time (SSI!) and the apparent absence of a proper regulatory framework were matters that, Congress felt, had to be addressed.
Though the Committee was therefore happy with the Presidential directives as laid down in the E.O. of 1983, it saw this measure only as a beginning as, in its view, and following hearings, study and analysis, the simple administrative designation of a lead agency could prove inadequate since its responsibilities would not be underpinned by legislative authority. The result, it was felt, could inhibit decisionmaking and interagency coordination and allow the existing inefficient approaches to commercial launch approvals to persist. Put differently, to leave the future of this industry to Presidential policies was tantamount to creating only temporary regulatory certainties, an unacceptable oxymoron for an infant industry. Hence, the determined Congressional efforts in 1983 and 1984 to draft legislation which would "facilitate the establishment of a stable regulatory climate, reducing uncertainty and investment risk".[83] The result of this legislative work was the *Commercial Space Launch Act* of 1984, which made the Secretary of Transportation responsible for carrying out the Act, with the specific task to

"... (1) encourage, facilitate, and promote commercial space launches by the private sector; and (2) consult with other agencies to provide consistent application of licensing requirements under this Act and to ensure fair and equitable treatment for all license applicants."[84]

It is important to note at the outset that the Committee, under the heading "Findings" in the Act, declared that the private launching services, which were the (only) subject of the Act, would *complement* the available government launch services, thereby accepting the primary role of the space shuttle. Also, the Committee found that the development of commercial launch services

83. See *Commercial Space Launch Act*, Report 98-816 (to accompany H.R. 3942), House Comm. On Science and Technology, 98th Cong., 2d Sess. (May 31, 1984), hereinafter referred to as House Launch Act Report.
84. See Commercial Space Launch Act, Pub. L. 98-575, 49 U.S.C. 2601-2623 (Oct 30, 1984), hereinafter referred to as CSLA or the Act (of 1984) at Sec.5 (2604(a). The Act was subsequently codified as 49 USC, Subtitle IX, Chapter 701 "Commercial Space Launch Activities".

would enable the U.S. to retain its competitive position internationally, a clear reference to both existing (Arianespace) and future (Russian, Chinese and Japanese) launch competitors and the role which ELV's in particular were supposed to play in this respect.[85]

Not surprisingly, Congress found that the provision of launch services by the private sector as such served U.S. national security and foreign policy interests: after all, it meant a further guarantee of 'assured access to space', for both military and civil space programs, with strategic gains in both fields vis-à-vis other countries.

Important for the interpretation and application of the Act and its ensuing regulations were the pro-industry, pro-deregulation concepts included in the final paragraphs of the findings:

"(6) provision of launch services by the private sector ... would be facilitated by stable, minimal, and appropriate regulatory guidelines that are fairly and expeditiously applied; and

(7) the [U.S.] should encourage private sector launches and associated services and, only to the extent necessary, regulate such launches and services in order to ensure compliance with international obligations of the [U.S.] and to provide for the national security, foreign policy, and public safety interests of the [U.S.]."[86]

The 'core' provisions of the Act are contained in Sec.6 (2605), which establishes the requirement of a DOT license for private space launch operations, *i.e.* a launch authorization and a - separate - payload 'approval' regime:

(a)(1) No person shall launch a launch vehicle or operate a launch site within the [U.S.] unless authorized by a license issued or transferred under this Act.

(b)(1) The holder of a launch license under this Act shall not launch a payload unless that payload complies with all requirements of Federal law that relate to the launch of a payload. The Secretary shall ascertain whether any license, authorization, or other permit required by Federal law for a payload which is to be launched has been obtained.

(2) If no payload license, authorization, or permit is required by any Federal law, the Secretary may take such action under this Act as the Secretary deems necessary to prevent the launch of a payload by a holder of a license under this Act if the Secretary determines that the launch of such payload would jeopardize the public health and safety, safety of property or any national security interest or foreign policy interest of the [U.S.].

85. The Committee in its Report, under the heading "[n]eed for legislation", anticipated "that world market demand for launch services will increase and that expansion of U.S. commercial launch services is desirable to enhance domestic economic activity and U.S. competitiveness in capturing the space launch market.", see House Launch Act Report, *supra* note 83, at 8.

86. See Sec.2 (2601) of the Act.

(c)(1) Except as provided in this Act, no person shall be required to obtain from any agency a licence, approval, waiver, or exemption for the launch of a launch vehicle or the operation of a launch site.
(2) Nothing in this Act shall affect the authority of the Federal Communications Commission under the Communications Act of 1934 (47 U.S.C.151 *et seq.*) or the authority of the Secretary of Commerce under the Land Remote-Sensing Commercialization Act of 1984 (15 U.S.C. 4201 *et seq.*).

The distinction between *launch* authority, *i.e.* permission to operate the launch vehicle, which is the Secretary's exclusive authority, and a *payload* license or authority which, in most cases, will be a matter of other agencies concerned, was made because, in cases where a complete (*i.e.* including review of public interest, foreign policy and national security concerns) and effective regulatory process with respect to specific satellites already existed, a duplicative process exercised by DOT would be unnecessary and unjustified. Hence the above exceptions for communications and remote sensing satellites: an FCC or DOC-NOAA license would thus not be further reviewed by DOT, other than to assure the proper integration of the respective payload with the launch vehicle and its launch into orbit.[87] For all other satellites/payloads DOT, in the view of the Committee, would perform a function analogous to that performed by NASA in overseeing payloads carried on the space shuttle. This includes a procedure to ensure safety to the launch vehicle, and an evaluation, in consultation with the Department of State and DOD, of the mission purpose of a payload to ascertain foreign policy and national security implications respectively. The latter DOT task is specifically dealt with in the Act, in a provision which appears to leave the final determination in such matters to the expert departments concerned.[88]
National security or foreign policy considerations may also cause the DOT Secretary to suspend or revoke a license issued under the Act or to terminate, prohibit or suspend immediately an actual launch. Although the roles of State or DOD in respect of such decisions have not been addressed in the Act, it must be assumed that these actions would, in practice, be taken on the *initiative* of one of (or both) the departments concerned or following a Presidential decision.[89] A few known instances of such cases, which will be discussed in Chapter 3, support that assumption. They also show that the national security/foreign policy criteria applied to all stages of the decision making process, though not a new phenomenon (NASA and its space shuttle clients could not escape this test either), introduced an element of uncertainty and unpredictability, which private enterprise, working in a competitive

87. See House Launch Act Report, *supra* note 83, at 19.
88. See Sec. 20 (2619) of the Act.
89. See Sec.10 and 11 (2609 & 2610 resp.) of the Act. For the licensee or license applicant thus affected, Sec.12 (2611) provides for both administrative and judicial review.

environment, was particularly allergic to. And the ELV industry and its clients would make their views abundantly clear![90]

The OCST Licensing regulations

A number of articles in the Act presuppose or explicitly refer to more specific regulations governing the various aspects of the licensing process, and detailing the right and obligations of the parties concerned.[91] Soon after the signing into law of the Act, DOT announced a licensing policy, which, pending the release of more definitive regulations, outlined the major components of the launch license required by the Act and described the Federal interagency process for evaluating license applications.The two were clearly interrelated, for, as DOT explained, its experience in assisting a launch applicant to obtain Federal approval for its first launch from a site in the Pacific Ocean (i.e. Starstruck Corporation's second launch) "amply demonstrated that the very nature of the consultative approach to licensing [i.e. relying on the existing expertise and specialized policy perspective of other Federal agencies] creates a compelling need for a carefully structured and effectively coordinated licensing process."[92] The above DOT Policy Statement, following the purpose and system of the Act, divided the licensing process into two distinct components: a *Mission Review* and a *Launch Safety Review,* and gave details on the aspects that would be addressed in each case, before mission approval and launch safety approval would be granted. These approvals formed the basis for the issuance of the *Launch License,* incorporating such conditions as adherence to applicable range safety requirements, airspace restrictions, third party liability insurance levels and federal inspection, verification and enforcement requirements. The DOT policy on interagency consultation in the same document outlined the Department's views on the way it would fulfill its statutory role as a focal point for launch licensing amongst all Federal agencies concerned. One of its main tasks, derived from the Act and

90. When discussion took place on the scope and contents of the implementing regulations (see *infra*), concern to that effect was expressed through COMSTAC. DOT, in its reaction, stressed that one of OCST's major goals had been to encourage and promote the industry through carefully considered policies and procedures designed to eliminate, wherever possible, regulatory uncertainties, and concluded: "[t]hus, the Office wishes to emphasize that it views the exercise of this authority as an extraordinary measure to be relied upon in truly emergency circumstances." See 14 CFR Ch.III *Commercial space transportation; licensing regulations*, 51 Fed. Reg. 6870 (Feb 26, 1986), hereinafter referred to as (OCST) Interim Regulations, Supplementary information, Section-by-section analysis, *ad* Part 405. The industry, although possibly to some extent reassured, would probably have preferred a joint statement of the three departments concerned.

91. See Sec. 7 (2606), 9 (2608) and 13 (2612) of the Act.

92. See *Commercial space transportation; licensing process for commercial space launch activities*, notice of policy and request for comments, DOT, Office of the Secretary, 50 Fed. Reg. 7714 (Feb. 25, 1985), hereinafter referred to as DOT Policy Statement.

highlighted by the Senate Committee on Commerce, Science and Transportation, was to review the requirements of existing applicable laws and determine, in consultation with the appropriate agencies,

"whether any requirement of Federal law that would otherwise apply to such activities is not necessary to protect public health and safety, the safety of property, and national security and foreign policy interests of the United States, and to eliminate, by regulation, such requirements as a requirement for a license under the Act."

In other words, it was to streamline the licensing process and to eliminate any duplicative or unnecessary requirements for the launch of a launch vehicle or the operation of a launch site. DOT promised in this connection to eliminate, wherever possible, the timeconsuming sequential reviews which characterized the experience of private launch applicants before passage of the Act, to specify, in consultation with each agency involved, the scope of that agency's review, to notify the applicant concerning the agencies to which the application had been forwarded, and to keep the applicant informed of the progress of the review[93] DOT did indeed live up to its promise: in early 1985, OCST referred a request of SSI for approval to launch a series of payloads (containing cremated human remains or "cremains") to DOD, State Department and NASA for mission review, with each agency being directed to address specific issues in its own review. OCST remained in control of the process and was SSI's only point of contact. In remarkable contrast to previous cases, SSI received a favourable response on its request from OCST in just 40 days.[94] The Act required the Secretary to issue regulations implementing the provisions of the Act. DOT regarded the above Policy as only the foundation for a more detailed regulatory structure to come, and promised further regulatory documents on areas of priority, such as launch license regulations (containing the more specific regulatory requirements), insurance regulations (detailing the Department's role in establishing third party liability insurance requirements) and national range use (informing the private launch operators on available government launch range facilities, including costs of service and special requirements, on the understanding that the regulation of the use of private launch sites - "unchartered waters in terms of both

93. See DOT Policy Statement, *supra* note 92, at paras. 5.A and B.

94. See Raclin, *supra* note 59, at 61-62. According to the author, DOD was asked to determine whether the launches would conflict with any existing [military] space program, the State Dept was instructed to evaluate the foreign policy implications, and NASA was asked to ensure that the proposed orbit would not interfere with any existing or proposed [civil] space program. The proposal, to launch 60 domestic and foreign payloads over a 10-year period, apparently did not raise any concerns on the part of the above agencies. But the State of Florida, home of the morticians whose idea it was, blocked the effort because, according to state law, a cemetery had to be connected by road to the municipal area it served!, see Lilian M. Trippett, *Legislative initiatives to encourage private activity*, 4 (1) J.L. & Tech 49-57 (1989) hereinafter referred to as Trippett, at 49.

Government and industry experience" - would be the subject of further evaluation).[95]

The (OCST) Interim Regulations which were promulgated in February1986 gave the promised detailed policies, procedures, standards and requirements for launch license applications.[96] Though formally still of a temporary character, these regulations and the policies and procedures articulated therein provided the necessary guidance to the launch industry for the years to come and were generally supported by all concerned.[97]
Some of these policies and procedures will be reviewed hereafter, in order to illustrate the regulatory environment in which the U.S. ELV industry had to work.
The Interim Regulations took from the Act and from the DOT Policy Statement the distinction between Mission review and approval and Safety review and approval.
The Mission Review focuses on such factors as the purpose and character of the proposed launch, the nature of the payload and the impact of the launch or payload on existing uses of space.This review is intended as the mechanism for addressing the U.S.' international obligations under, for instance, the Outer Space Treaty and the Space Liability Convention (see *infra*), as well as national security and foreign policy implications of a launch. This review would determine whether the payload interfered with other spacecraft or endangered other nations or (otherwise) would conflict with vital national interests. The review, by its nature, would involve close consultation with the Departments of State and Defense, and possibly NASA and other agencies, as appropriate. As indicated above, where another agency was in charge of licensing, such as the FCC for U.S. communications satellites and Commerce (NOAA) for U.S. remote sensing satellites, DOT would simply accept those licenses as satisfying the requirements of mission review pertaining to the payload.[98]

95. See DOT Policy Statement, *supra* note 92, at para. 6.
96. See (OCST) Interim Regulations, *supra* note 90.
97. See *Commercial space transportation*; licensing regulations, 14 CFR Ch. III, OCST, DOT (Docket No. 43810), Final rule (April 4, 1988), hereinafter referred to as the OCST Licensing Regulations, Supplementary information, 'Comments on the Interim Regulations'.
98. The Office received 22 comments on the DOT Policy Statement, 14 submitted by private individuals, three from launch companies, two from trade associations, one from a rocket motor manufacturer, one from a Federal agency and one from a trade newsletter. Most comments addressed the Mission Review, and more in particular the vagueness of the recurring phrase (in the Act) "national security interests and foreign policy interests", the possibility that an agency (NASA?) could misuse the interagency review process to protect its own commercial space activities, or that routine launches would (still) be subject to separate repetitive payload reviews. DOT's response was basically the same in each case: don't worry, the spirit of the Act is to have as little regulatory interference and as much predictability and certainty for private industry as possible, see (OCST) Interim Regulations, *supra* note 90, Supplementary information, ("comments on the policy statement").

Part 411.7(a) of the Interim Regulations reflects the pro-approval presumption already embodied in the Act and confirmed by Congress (*i.e.* private commercial launches are, as a general matter, consistent with U.S. national security and foreign policy interests):

"Mission approval will be granted absent clear evidence that some aspect of the proposed launch poses a threat to distinct U.S. national security or foreign policy interests, constitutes a hazard to public health and safety or safety of property, or is inconsistent with international obligations of the United States."

As indicated above, each Federal agency reviews its own payload, and OCST will not duplicate the substance of such reviews but only ascertain that it has indeed taken place. *Foreign* telecommunications or remote sensing satellites/payloads will be reviewed by OCST, in consultation with DOD and State. For foreign or domestic payloads *not* covered by any existing Federal regulatory regime OCST will perform a full review itself, in consultation with other appropriate Federal agencies.

The (Launch) Safety Review is a technical review which focuses only on an applicant's proposed safety operations. The Office noted that, both at the time of the announcement of the DOT Policy Statement (early 1985) and when the Interim Regulations were established (early 1986), the only published safety standards or requirements in force were those applicable to safety operations conducted at Federal (*i.e.* NASA and Air Force operated) launch ranges. (As the launch vehicle operator must obtain a *launch safety approval* from the range operator, OCST, in order to avoid confusion renamed its own review *Safety Review).* No such standards existed yet for private launch ranges. The Act, also for that reason, encouraged the use of established Federal launch ranges. It simplified the safety review to the extent that the safety requirements imposed by the range operator were supposed to cover all launch site related safety concerns OCST might have. To determine the level of safety in case of the use of a private launch site, the Office would request detailed information on such matters as site location, operating procedures, personnel and equipment, and rely heavily on the expertise available within NASA and USAF.[99]

99. See Part 411.5 and 415.11-19, Interim Regulations, *supra* note 90.

2.2.2.1 Liability and Insurance

Traditionally, the State Department's foreign policy concerns would include the question of adherence to the bilateral and multilateral treaties to which the U.S. is a party. In the early stages of the space effort, as we saw in the first paragraph of this Chapter, this also involved such selection of experimental space projects as would support - or at least not endanger - the adoption of the concept of freedom of outer space, including the freedom of 'overflight', by the community of states, preferably through the U.N., and more in particular by the Soviet Union. The Outer Space Treaty of 1967, drafted and finalized by the (Legal Subcommittee of the) United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) now contains that basic concept.[100] The Treaty also provides for 'State responsibility' and 'State liability'.The first concept was a compromise between two conflicting politico-legal philosophies, the U.S. approach to space exploration as an activity that may also (or even primarily) be undertaken by private enterprise and the Soviet view that the use of space should not be perverted by capitalist practices and space activities should thus remain a State's prerogative only. With the establishment of Comsat Corporation in August 1962, U.S. private enterprise had 'entered' outer space, so for the U.S. the Soviet view was, also from a practical point of view, not an acceptable proposition. The compromise, *i.e.* private space activities are permitted, but subject to "authorization and continuing supervision by the appropriate State party to the Treaty", made the State *responsible* for the proper behaviour, *i.e.* behaviour in accordance with the provisions of the Treaty, of the individual or company concerned.[101]
By virtue of this provision, U.S. government supervision of ELV operations was called for: the Commercial Space Launch Act and its ensuing regulations give the DOT the power, in consultation with State, to ensure that the

100. See art. 1, "Outer space, including the moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law ...", and art. 2, "Outer space ... is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.", Treaty on principles governing the activities of states in the exploration and use of outer space, including the moon and other celectial bodies, signed at Washington, London and Moscow on January 27, 1967, ratified by the U.S. May 24, 1967, proclaimed by the US President October 10, 1967, e.i.f. October 10, 1967, 18 UST 2410; TIAS 6347.

101. See full text of art.VI of the Outer Space Treaty: "States Parties to the Treaty shall bear international responsibility for for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to theTreaty. When activities are carried on in outer space, including the moon and other celestial bodies, by an international organization, responsibility for compliance with this Treaty shall be borne by the international organization and by the States Parties to the Treaty participating in such organization."

Government's obligations under the Outer Space Treaty are met.[102] Hence the Act's broad jurisdiction which requires a launch license of every person who launches a launch vehicle or operates a launch site within the U.S. and of every U.S. citizen launching or operating a launch site *outside* the U.S.[103]

Additionally, the Outer Space Treaty made a state that launches or procures the launching of an object into outer space and each state from whose territory or facility an object is launched internationally *liable* for damage caused therewith to another party or to its natural or juridical persons.[104] In other words a private ELV launch from U.S. territory, causing damage to another state or its nationals would make the U.S. liable.
The question of liability for space launch damage was addressed in more detail in a special Space Liability Convention, also drafted and finalized by UNCOPUOS, which became effective in 1972.[105] The core provision of that Convention, creating state liability (also) for *private* launch activities from a state's territory or facility, led the draftsmen of the Commercial Space Launch Act to introduce a provision requiring licensees under the Act to have liability insurance in an amount determined by the Secretary which would be sufficient to satisfy possible obligations of the U.S. under the Outer Space Treaty and the Space Liability Convention.[106]

102. This is not to say that, prior to the enactment of the CSLA, such "continuing supervision" was absent: as we saw above, various departments, including the State Department, felt authorized to review private launch operations and did so in practice. The CSLA streamlined the process and put this role into the hands of one department.
103. See Sec. 6 (2605); U.S. citizen is defined as follows: "(A) Any individual who is a citizen of the [U.S.]; (B) any corporation partnership, joint venture, association, or other entity organized or existing under the laws of the [U.S.] or any State; and (C) any corporation, partnership, joint venture, association, or other entity which is organized or exists under the laws of a foreign nation, if the controlling interest (as defined by the Secretary in regulations) in such entity is held by an individual or entity as described in subparagraph (A) or (B)", see Sec.4 (11) (2603)(11), redesignated (12) in 1988 by virtue of the Commercial Space Launch Act Amendments of 1988, Pub. L.100-657, Nov. 15, 1988, 102 Stat. 3900, hereinafter referred to as CSLA Amendments 1988, Sec 3(2), (3)).
104. Art. VII; the full text reads as follows: "Each State Party to the Treaty that launches or procures the launching of an object into outer space, including the moon and other celestial bodies, and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons by such object or its component parts on the Earth, in air space or in outer space, including the moon and other celestial bodies".
105. See Convention on international liability for damage caused by space objects, signed at Washington, London and Moscow March 29, 1972, ratified by the U.S. May 18, 1973, proclaimed by the US President November 21, 1973, e.i.f. October 9, 1973, 24 UST 2389; TIAS 7762.
106. See Sec. 16 (2615), which reads in full: "Each person who launches a launch vehicle or operates a launch site under a license issued or transferred under this Act shall have in effect liability insurance at least in such amount as is considered by the Secretary to be necessary for such launch or operation, considering the international obligations of the [US]. The Secretary shall prescribe such amount after consultation with the Attorney General and other

The DOT Launch Policy of 1985 translated the above provision into a condition included in any launch license issued which would determine the required level of third party liability insurance. An Insurance Regulation providing guidance on the Department's role in establishing such third party liability insurance requirements was to be developed and published shortly. DOT, in the same year, made some suggestions to that effect, *inter alia* on methods to assess the appropriate level of insurance, and requested comments thereon.[107] One of the methods DOT submitted was that the launch firm would purchase the maximum level of insurance commercially available at reasonable rates. The second method would set an appropriate level based upon an analysis of the risks of the launch. As one author observes, either method had its downside: the maximum level method would not necessarily produce an adequate coverage or one at a too high price, whereas the risk analysis method would be difficult to apply in case of new firms or new technology entering the market.[108] In this connection it is important to recall that the Space Liability Convention adopted the -'victim- oriented' - concept of absolute and unlimited launching state liability for damage caused to third parties on the ground or to aircraft in flight.[109] The potential exposure of the launching state, launch firm and insurance firm could therefore be of nightmarish proportions. The Government was understandably inclined to shift this burden to private enterprise by requesting the launch firm to purchase adequate commercial insurance naming apart from the purchaser also the U.S. Government as beneficiary of the policy. On the other hand, exposing the infant commercial ELV industry accustomed, in the role of government contractors, to government protection against such hazards to the cold wind of unlimited liability or sky-high insurance premiums could hardly be reconciled with the lofty ELV privatization/commercialization principles of both the President and Congress.

The space insurance industry's experience with launch activities until the mid-1980s was at the same time far from encouraging, partly because of the novelty

appropriate agencies." This provision should be distinguished from Sec. 15. (c) (2614.(c)) which deals with liability insurance in connection with the use of government property, *e.g.* a Government launch site, services and/or personnel: "The Secretary may establish requirements for liability insurance, hold harmless agreements, proof of financial responsibility, and such other assurances as may be needed to protect the [US] and its agencies and personnel from liability, loss, or injury as a result of a launch or operation of a launch site involving Government facilities or personnel".

107. On May 7, 1985, DOT issued the Advanced Notice of Proposed Rulemaking, ANPRM, *Commercial space transportation; third party liability insurance for commercial space launch activities*; requests for public comment, 50 Fed. Reg. 19280 (May 7, 1985).
108. See Raclin, *supra* note 59, at 60.
109. See, for a detailed study of the (background and meaning of the) Space Liability Convention, H. Peter van Fenema, *The 1972 Convention on international liability for damage caused by space objects*, LL.M. thesis (unpubl.), McGill University, Montreal (1973).

and therefore the unpredictability of the risks attached to launching, partly because of the very limited number of insured launches,[110] and thus also a thin spreading of the risks, and of course mainly because of the high failure rate itself. One satellite manufacturer's analysis put the total revenue in launch insurance for the period 1977-1985 at USD 450 million and the total of claims paid at USD 900 million, a so-called 'ratio' of 200%. For 1984-1985, the loss ratio was even 330%.[111] Though none of these launch failures resulted in claims from third parties, their occurrence had an understandable effect on both the level of insurance available and the premiums charged.
For commercial launches on the shuttle, *NASA* required its customers to purchase USD 500 million of third party liability insurance for any single payload (and a joint maximum of USD 750 million, paid for proportionally by all customers, in case of multiple payloads on one shuttle flight) and include the Government as named insured in the policy at no cost. In return, NASA *indemnified the user (i.e. covered the cost of damages) above that level.*[112]

110. In the insurance industry, large numbers of events are needed to increase the statistical validity of predictions. In space launches, the numbers were rather insignificant, thus making it very difficult to accurately measure risks per launch vehicle. One industry expert called for some 600 flights per type of launch vehicle. In reality, these numbers were substantially less: between 1960 and 1988, the Delta vehicle was used 182 times, of which only 48 times in the last 10 years (with changing technology and power through the years); in 1988, the Ariane had flown 24 times, 4 of which ended in failure. The risks connected with this small number of events was moreover shared by a very limited number of insurance companies, see *Insurance and the U.S. commercial space launch industry*, Report 100-112, Senate Committee on Commerce, Science, and Transportation, 100th Cong., 2d Sess. (July 1988) hereinafter referred to as Senate launch insurance report 1988, at 7-8.
111. See *id.* at 9-10. The ratio in 1982 was 120%; 1983 was a successful year for satellite launches, but 1984 a bad one: the underwriters' combined ratio went from 90% (i.e. a 10% profit) at the beginning of 1984 to 180% (i.e. a loss of 80%) by June 1984: During a 1984 shuttle launch two satellites (Indonesia's Palapa 2-B and Western Union's Westar VI) were not placed into correct orbits. Although they were later recovered during another space shuttle mission and sold to another user, the insurer had to pay a total of USD 182 million in claims. The failure of an Atlas-Centaur launch in June 1984 resulted in the loss of an Intelsat V satellite worth USD 102 million. Insurance premiums for a shuttle launch rose from 5-7% of the value of the satellite in 1983 to 15-20% in June 1984. And in 1985, five more satellites were destroyed as a result of launch failures, costing the insurers a further USD 370 million. The year 1986 was catastrophic: in January the space shuttle Challenger exploded, killing the seven member crew. And in the months thereafter a US Titan, a US Delta and an Ariane launch vehicle failed, all resulting in the loss of the payloads: the combined ratio reached 148% and "satellite underwriters lost total confidence in satellite launches", see *ibid.* Premiums for launch insurance, still 5% in 1979 reached 30% in 1986, *id.*, at 5.
112. An amendment to the NASA Act, effective October 1, 1979 added a new Sec. 308, entitled Insurance and indemnification, which read as follows: "(a) The Administration is authorized on such terms and to the extent it may deem appropriate to provide liability insurance for any user of a space vehicle to compensate all or a portion of claims by third parties for death, bodily injury, or loss of or damage to property resulting from activities carried on in connection with the launch, operations or recovery of a space vehicle ...

The U.S. private launch companies, for each license application, had to await the examination of their 'case' by DOT, which would determine the amount of risk to the public associated with the launch and the corresponding insurance requirements. Launch companies could then decide on the extent of the remaining exposure (on the basis of their own perception of the risks) and buy insurance above the level required by DOT, to protect their assets in the event of losses above the risk as defined by DOT. The problem for these companies was that, although the risk of a catastrophic accident was small, "one such accident could wipe out their company and thus they would be "betting the company" with each commercial launch".[113] In all these cases, it was entirely possible that the insurance required by DOT or the additional insurance found necessary by the company would simply not be available or too expensive, thus effectively grounding the vehicle.
Understandably, the private companies referred to the above NASA policy as a sensible approach to their problems. They also pointed at *Arianespace*, active in the commercial launch market on behalf of Europe since the Ariane maiden flight of December 1979. The French government, from the start, provided third party liability coverage for any claims over 400 million French francs (equivalent to about USD 70 million in the mid-1980s), a level based on NASA's third party liability insurance requirement for ELV launches in the 1970s.[114] The launch industry maintained that without a similar U.S. Government policy applying to ELV launches it would be difficult for them to compete with either the shuttle or the foreign launch provider.

All NASA's launch services agreements, whether involving the use of the space shuttle or an ELV, also contain a cross-waiver of liability, first developed to facilitate multi-client use of the shuttle and to simplify the allocation of risk. Each participant in the launch (project) agrees not to sue any other participant in the same launch for damage or loss of property that might occur. This provision effectively takes away the need for insurance against claims for damage caused by a party to the launch to any other party involved

(b) Under such regulations in conformity with this section as the Administrator shall prescribe taking into account the availability, cost and terms of liability insurance, any agreement between the Administration and a user of a space vehicle may provide that the [US] will indemnify the user against claims (including reasonable expenses of litigation or settlement) by third parties for death, bodily injury, or loss of or damage to property resulting from activities carried on in connection with the launch, operations or recovery of a space vehicle, but only to the extent that such claims are not compensated by liability insurance of the user ...", see National Aeronautics and Space Act of 1958, as amended, reprinted in *Space law and related documents: International space law documents, U.S. space law documents*, S. Print 101-98, Senate Committee on Comm., Science and Transp., 101st Cong., 2d Sess. (June 1990), hereinafter referred to as Space law and related docs 1990 at 445-471.

113. See Senate launch insurance report 1988, *supra* note 110, at 11.
114. The insurance level NASA required was USD 100 million, which at the time converted to 400 million francs: See *id.*, at 15).

in the same launch.That saves money, but it also reduces uncertainty. With the largest class of potential claims eliminated, each party may proceed unburdened by the concern that other involved parties may bring claims against it, not without importance, particularly for private companies whose Directors (or lawyers) might otherwise object to assumption of large but undefined and unlimited contingent liabilities, or, depending on the novelty of the activity might be faced with prohibitive insurance costs.[115]

Liability/insurance and the use of government launch facilities

One of the issues DOT addressed at the outset was the use by private launch operators of government launch facilities, such as Cape Canaveral or Vandenberg Air Force Base. The rules and procedures of both NASA and the USAF had been devised to regulate government launches and now needed adaptation to meet the requirements and problems connected with private use. So OCST and USAF in 1984 reviewed existing policies, procedures and processes affecting the cost and commercial use of the respective national ranges.[116]

The Act required the Secretary "to facilitate and encourage the acquisition (by lease, sale, transaction in lieu of sale, or otherwise) by the private sector of launch property of the [U.S.] which is excess or is otherwise not needed for public use and of launch services, including utilities, of the [U.S.] which are otherwise not needed for public use."[117]

A point, raised by the launch industry in this connection, was the less than accommodating way in which NASA and DOD in practice handled the industry's use of the government launch sites and facilities. Where the Act encouraged the use of such government facilities, the OCST Interim Regulations confirmed the authority of the agencies in charge of those facilities to set their own safety-related conditions:

"All launch licenses issued under these circumstances will be conditioned by the requirements that the applicant : (1) comply with all applicable safety requirements and procedures of the range or launch site in question and (2) inform the Office of and obtain approval for any planned or proposed deviations from or alternatives to such requirements or procedures."[118]

115. See Edward A. Frankle, NASA, Statement before the Subcommittee on Science, Technology, and Space, Senate Committee on Commerce, Science, and Transportation (Mar 5, 1998), hereinafter referred to as Frankle 1998, at 3 <http://www.hq.nasa.gov/office/legaff/frankle3-5.html>.
116. See Steptoe 1984, *supra* note 60, at 194-195.
117. See Sec 15 (a) (2614 (a).
118. See Sec. 411.5, Interim Regulations, *supra* note 90.

The agencies concerned, not particularly interested in pleasing the ELV industry (which had no alternatives anyhow), imposed detailed insurance requirements and far reaching obligations on the industry to indemnify the government for losses arising from the conduct of launch operations. By virtue of the above regulation, these requirements became part of the launch license conditions. It took a long time before even standard conditions were developed which gave some predictability as to the requirements imposed by the government launch operators. And when these were finally published they confirmed the harshness of the terms, at least in the perception of the users. The so-called *Air Force Model Agreement* of December 1986, though published after the Challenger disaster and the ensuing Presidential pro-ELV initiative (see chapter 2.2.4. hereafter), apart from reserving the right of the Government to preempt any or all launches from facilities covered by the agreement, still required the private users to assume all, *i.e.* unlimited, liability for all damages in connection with any activities related to the launch, including third party and government property damage, to indemnify the Government and hold it harmless for such liability and to obtain the necessary insurance for that purpose.[119] No guidance was given as to acceptable disparities between the required and the obtainable level of insurance, and, apparently, it proved difficult both for the industry and for DOT to come to terms with USAF on clear, fair and workable conditions in this field, a factor which seriously affected the investment community's enthousiasm to put its money into this promising infant industry. According to one author, "[t]he existence of the current Air Force model agreement ... frankly is scaring the living daylights out of ... the investment community."[120]

2.2.2.2 The launch pricing (subsidization) issue

One of the thornier issues to be addressed by OCST right from the start was its relation with NASA. One can imagine at least one of the reasons: where sofar, NASA had been responsible for all civilian launches, it now had a competitor whose mandate to promote the ELV industry not only brought regulatory influence in this field but also introduced free market concepts, including pricing considerations (and OCST/NASA negotiations on the matter). These were not only rather new to NASA but also posed a threat to its own

119. See *Expendable launch vehicle commercialization agreement*, art. III, 12 Annals Air & Space L. 467 (1987).

120. See Kim G. Yelton, *Evolution, organization and implementation of the Commercial Space Launch Act and Amendments of 1988*, 4 (1) J. L. & Tech 117-137 (1989) hereinafter referred to as Yelton, quoting a statement made during a Congressional hearing on the state of the US launch industry, at 131-132. Yelton adds:"The Air Force refused to set specific amounts of required insurance, to negotiate with the launch providers in connection therewith and to acknowledge the Transportation Secretary's role in this regard.", *ibid.*

job to make the shuttle the preferred omni-purpose space transport system (and to set its own prices accordingly).[121]

NASA's launch arrangements with potential customers since the late 1970s provided various alternatives to accommodate different types of use (rs). One arrangement, the *Joint Endeavor Agreement* (JEA) was a cooperative arrangement between NASA and U.S. citizens (individuals, corporations etc.) which allowed the latter *free* flight on board the shuttle for experiments and/or technology demonstrations of products which have a commercial potential. The company develops the test, NASA takes care of transportation, and gets all data resulting from the experiment and obtains the royalty-free license to use the product or invention in case the private party does not take care of its commercialization itself.[122]
For small payloads (not larger than 5 cubic feet or two hundred pounds) NASA offered the so-called 'Get-away Specials', *i.e.* launch services on a space available basis at reduced cost, for small-scale experiments of a scientific research and development basis; and, also on a space-available basis, the 'Hitchhiker' program providing expanded services for larger payloads of an experimental nature.[123]
NASA's main product, the shuttle orbiter's cargo bay, was sold to its commercial customers at a fixed price of USD 38 million in 1982 dollars through fiscal year 1985, USD 71 million for fiscal years 1986-1988, and at a price established through an auction process (but USD 74 million at a minimum) for the years thereafter. These fixed prices represented a reimbursement of part of the 'operational costs' of the flight and did not take into account either the development cost of the shuttle or the fixed costs such as the launch site or launch towers.[124] The Presidential Directive on Commercialization of ELV's of 1983 had contained the following observation on this point:

"Through FY 1988, the price of STS flight will be maintained in accordance with the currently established NASA pricing policies in order to provide market stability and assure

121. Interestingly, two commentators, rather dramatically describing the ensuing bureaucratic struggle between the two agencies as the David of the OCST facing the Goliath of space leadership and industry in the free world, see on the side of the Goliath of NASA (and thus confronting OCST) the U.S. aerospace industry, to wit General Dynamics and Martin Marietta, the private ELV owners/operators who "owed a good portion of their corporate economic stability and financial allegiance to NASA" and, as "large cost-plus aerospace contracters" apparently were not terribly lured by the promise of free market economics. See Robinson & Meredith, *supra* note 74, at 7, 8.
122. See Raclin, *supra* note 59, at 42-43.
123. See *id.*, at 40-41.
124. See *id.*, at 37. The author notes that the development cost of the shuttle program was in the order of USD 10-15 billion, whereas the fixed cost of maintaining the system had been estimated at USD 1 billion per year, see *ibid.*

fair competition. Beyond this period it is the U.S. Government's intent to establish a full cost recovery policy for commercial and foreign STS flight operations."[125]

It is clear that the above fixed amounts did not cover the full costs of the shuttle. In fact, Congressional budgetary experts, testifying at a 1986 Hearing, calculated that the full cost of a shuttle flight in 1989 (at 1982 dollars) would be USD 150 million. As this amount was based on an overly optimistic launch rate estimate of 24 flights per year, the figure faced criticism and was adjusted to USD 186 million in case 'only' 18 flights would take place.[126] The reality was that, though the launch rate increased, none of these years yielded a launch rate exceeding 10 flights per year (with 1985 being the best year ever with a launch rate of 9), of course also as a result of the Challenger accident in early 1986.[127]

Both DOT and the established ELV manufacturers and newcomers in the commercial launch market contended that, as long as this subsidization of the shuttle's costs continued with regard to ELV-compatible payloads, these private companies would not enter the market: the USD 71-74 million shuttle launch price translated to a cost of about USD 26-27 million for a Delta class payload, for which, if launched by the Delta ELV, the private company would have to charge at least around USD 40 million to break even. Put differently, as one newcomer did, it would require a shuttle price of USD 150 million for the ELV industry to be able to compete at all.[128]

Interestingly, the above USD 38 million launch price NASA quoted in the early 1980s came from an estimate made in 1977 by the Agency which was based on a launch rate of 572 (!) missions to be flown between 1980 and 1991. With costs consistently and considerably exceeding budgets and launch rate projections declining, NASA, in 1984, had to increase the price to stick to its own promises and prepare itself for the year 1988, chosen by Reagan as the year in which full cost recovery should have been attained. But one year later, NASA reviewed the effect of its price policy and came to the conclusion that it amounted to handing clients to Arianespace on a silver plate and losing market share in the international commercial market as a result. Where once the U.S. had a complete monopoly, in a few years time Arianespace, with 30 firm launch contracts concluded at the end of 1984 and approaching 40 in the course of 1985,[129] had taken about 50% of the market of international

125. See ELV Commercialization Directive *supra* note 70.
126. See Raclin, *supra* note 59, at 38.
127. Launch rates for the first 75 flights were as follows: 1981: 2, 1982: 3, 1983: 4, 1984: 5, 1985: 9, 1986: 2, 1987: 0, 1988: 2, 1989: 5, 1990: 6, 1991: 6, 1992: 8, 1993: 7, 1994: 7, 1995: 7, see Space Shuttle 1996 *supra* note 51, at 268, 286 and 292.
128. See Raclin, *supra* note 59, at 39.
129. Arianespace's sales activities since its start of operations showed the following pattern of success: (in firm launch contracts on Dec 31 of each year) 1981: 10; 1982: 16; 1983: 25; 1984: 30; 1985: 41:; 1986: 58, see *The world's first commercial space transportation company*, Arianespace brochure, France (1993).

communications satellite launchings. Hence, in 1985, NASA's request to lower its price to USD 70.4 million, which would make the shuttle more competitive, both internationally and - to the understandable displeasure of the ELV industry and DOT - also domestically. And of course it meant that the concept of cost recovery had been replaced by market share considerations.

The ensuing heated debate between NASA and, in particular, the ELV lead agency DOT, showed the absurdity of trying to reconcile two conflicting policies, *i.e.* of encouraging the creation of a new private launch industry while maintaining and subsidizing the shuttle as the 'primary' launch system for fostering the many space interests and goals of the U.S., including the sale of launch services to domestic and foreign clients.
DOT (OCST) strongly and persistently argued for the shuttle to stick to shuttle-unique uses (needing human presence), and advocated much higher shuttle prices for commercial launches in order to remove this very effective entry barrier for the commercial ELV firms: instead of NASA's proposed USD 70.4 million launch fee, they suggested USD 129 million. That "would allow entry by the private sector, leading to greater competition, innovation, and lower prices for all launch systems, thereby stimulating demand for still more launches and a more 'robust' national launch capability".[130] NASA was definitely not amused, and fought back with all the power, experience, knowledge and assistance of allies the agency could mobilize.
Although DOT was new in the space business and policy 'arena' and its knowledge of the industry and the forces at work there was limited, it had an important ally in the form of Reagan's own politico-economic philosophy, that is, to withdraw the government from any activity that could be performed by the private sector. DOT basically advocated the transfer of a commercial activity, the operation of a commercial transportation system, from a government agency which had other primary tasks (research and development) to private enterprise, and found the Department of Commerce on its side. The latter Department, which had space commerce responsibilities of its own, also had a problematic relationship with NASA because of the latter's competing role in space commercialization and its resistance to a more private enterprise - driven space effort.

NASA's reaction to the views and actions of the above departments was to a large extent based on its long history of being the sole provider of access to space, its immense aerospace know-how, its highly successful cooperative programs with the scientific community and industry in furthering space exploration and creating commercial spin offs, and its deep mistrust in the

130. See Jack Scarborough, *The privatization of expendable launch vehicles: reconciliation of conflicting policy objectives*, 10 (2/3) Policy Studies Review 12-30 (1991) hereinafter referred to as Scarborough, at 17.

'fitness, willingness and ability' of the ELV industry (and DOT) to take over even a part of NASA's traditional transportation role.[131]
NASA had, since 1984 (!), an important space commercialization mission[132] which could only be accomplished with launch pricing acceptable to its U.S. users. And it could earn extra - much needed - income by selling excess capacity of shuttles, that would fly anyhow, at a discount to foreign users. Increasing the shuttle launch price would endanger both its domestic and foreign role and thus, to some extent, threaten NASA itself.
Moreover, NASA - not without merit - maintained, that new modes of transportation (rail, air) had always been subsidized. In this connection there was little difference between a NASA subsidy for shuttle launches and Department of Defense funding of ELV research and development, procurement contracts, the use of launch facilities at less than full cost and other benefits which the ELV industry had received, preparing it for the new role of launch provider.[133] The pricing issue was finally dealt with by President Reagan. In August 1985 he announced that the price for a shuttle launch would be set at USD 74 million. NASA had won.[134]
The decision was later formalized by Congress, which, formulated in some more detail what the shuttle pricing policy was supposed to accomplish:

"(1) the preservation of the role of the United States as a leader in space research, technology, and development;
(2) the efficient and cost effective use of the Space Transportation System;
(3) the achievenment of greatly increased commercial space activity; and
(4) the enhancement of the international competitive position of the United States."[135]

131. As Scarborough notes, NASA saw the ELV industry as "too risk averse, too conditioned to large cost-plus-fifteen-per cent contracts, to invest in what, for them, would be a marginal business ... If the market should fail or if they find they cannot compete, they simply can revert to being government contractors, which is what they prefer to be anyway.", see *id.*, at 21,
132. Sec. 102 of the NASA Act of 1958, entitled "Declaration of policy and purpose", was amended by the [NASA] Authorization Act 1985, Pub. L. 98-361 (July 16, 1984) Sec. 110 (a) (98 Stat. 426), which added the following paragraph (c): "The Congress declares that the general welfare of the [US] requires that [NASA] ... seek and encourage to the maximum extent possible the fullest commercial use of space.", see Space law and related docs 1990, *supra* note 112, 443-471, at 445. See also Frankle, Concord or discord?, *supra* note 14 at 216; the author quotes House Report 98-629, which states that "[t]he Committee wishes to emphasize that this language is intended to encourage NASA to agressively pursue all areas of potential commercialization.", *id.*, at note 5.
133. See *ibid.*
134. See *Shuttle pricing for foreign and commercial users* (NSDD 181 of July 30, 1985). Fact sheet (Aug 1, 1985), see Scarborough, *supra* note 130, at 23. Scarborough suggests, on the basis of interviews with officials involved in the pricing issue, that the President's decision was probably driven most by the threat to the shuttle posed by international competition, "grounded in a strong sense of pride in the shuttle as a symbol of national strength ... [The] decision ... was a victory for nationalism over economics.", see *id.*, at 23 and 27.
135. See *Shuttle pricing policy for commercial and foreign users*, NASA Authorization Act

The findings of Congress gave more insight in prevalent thinking on the role of the shuttle system. One thing had slightly changed: instead of being declared the only launch system or the preferred system for all purposes, the Space Transportation System was now found to be "the primary space launch system for both *United States national security and civil government missions*". (emph. add.) It followed from the text that, for commercial use, the shuttle was *not* the primary launch system. As the finding further read, "[STS] contributes to the expansion of the [U.S.] private sector investment and involvement in space and therefore should serve commercial users". This was a clear confirmation of the NASA approach to the issue which therefore maintained the regulatory uncertainty for the private launch industry.
The above shuttle pricing policy made clear that the problem, of how to turn the ELV industry's commercialization, which had received specific endorsement from Congress, into reality, had simply not been solved. Where two systems continued to receive verbal support, but the effects of their being competitors was not adddressed, and one of these, the shuttle had a *de facto* headstart, it had to be accepted that, for the time being, there would be no independant ELV industry marketing their products internationally or domestically.

It should be noted that during these interim years, because the space shuttle could not fulfill all its expectations, the manufacturers continued to produce launch vehicles for others, particularly the Air Force. The latter had decided to rely upon (present and new) Titans, produced by Martin Marietta, for the launch of, among others, weather satellites into polar orbits. But, as a result of the government's non-committal approach towards the ELV's, there were no private U.S. operators offering launch services to the satellite manufacturers and operators.
Though NASA, as a result of the shuttle decision, was definitely leaving the ELV business and offered all launchers and related hardware in its inventory to private enterprise, the number of serious 'takers' proved to be limited.
One such party, *Trans-Space Carriers, Inc.* (TCI), was interested in taking over and marketing the *Delta* launch vehicle and, in 1984, signed a preliminary contract with NASA to that effect. The conditions TCI had to fulfill, presumably to show its worth as a candidate launch provider, were (1) to enter into a production agreement with McDonnell Douglas which had closed its

(1986), Pub.L. 99-170 (99 Stat. 1012), Dec 5, 1985, 42 U.S.C. 2466, 66a-66c, Title II, Sec. 201-205, in Gorove US Space Law, *supra* note 55 at I.A.1 (d). The NASA Administrator had the authority to reduce the above base price in case he felt that the policy goals were not being achieved, but not without having enabled Congress to review his arguments for such a decision (Sec. 204(c)(1)); price reductions could not however bring the minimum price below the 'additive cost' (Sec. 204(c)(2)), *i.e.* the average direct and indirect costs to [NASA] of providing additional flights of the [STS] beyond the costs associated with those flights necessary to meet the space transportation needs of the [US] Government." (Sec.203(2).

production line, and (2) to sell three launches. (The latter would of course also be a pre-condition of MDD for re-opening the Delta production line.) TCI, a relatively unknown entity in the launch world, was unable to attract customers willing to construct or adapt satellites specifically for Delta launches. And its early experience with the effect of the Arianespace marketing and sales practices made it decide, in 1984, to ask the U.S. government to take measures against the European competitor (see later).
The *Atlas* launcher, also available for transfer to a private launch provider, found one candidate, its own manufacturer General Dynamics, who would some years later indeed start its own sales activities.
But, as the above regulatory and competitive conditions did not change, the period 1983-1986 saw no U.S. firms confronting their European counterpart in the international commercial launch market.

The TCI complaint

Thus, NASA and Arianespace remained the principal players in this field. Their comparable status as providers of subsidized services came to the fore when prospective launch services provider *TCI*, confronted with the difficulty of attracting domestic or foreign customers, launched a legal attack on Arianespace, alleging that the latter was subsidized by the Europeans and that it was dumping launch services in the U.S. market.[136]

136. TCI was incorporated in Maryland in September 1982, following the announcement of the US government that it planned to withdraw from the ELV business. It was formed specifically to provide launch services using the assets, technology and operational experience of NASA's Delta Launch Vehicle Program. In October 1983, TCI submitted a proposal to NASA to continue the management and operation of Delta as a commercial enterprise. (This included the acquisition of Delta assets such as spaceflight hardware and materials and the hiring by TCI of NASA personnel then working on the program) At the time of its complaint, TCI had signed an agreement with NASA whereby the necessary government facilities and equipment would be leased to, or purchased by, TCI, and the company had obtained exclusive marketing and production rights for future Delta launches. TCI would succeed to the launch authority after NASA had completed its manifested Delta launch program in October 1984. And management of the launch operations at Cape Canaveral and Vandenberg AFB would be transferred to TCI. All of the major Delta supply contractors such as McDonnell Douglas, Norton Thiokol, TRW, and Rockwell International (Rocketdyne Division), had, according to TCI, agreed to continue their supply roles for commercial Delta production as managed by TCI. The launch company was negotiating specific contracts with these suppliers, with NASA technical and management personnel and with the Air Force launch range service authorities for transition of their services to TCI. The Delta, designed to carry a single payload of between 2,000 and 5,000 pounds, was presented as "the free world's most successful spacecraft launch vehicle, having launched over 40% of all civil spacecraft", with an overall success rate since 1960 of 93.8%, and, since 1974 of over 97%. TCI promised to launch at about $11,000 per pound of payload launched into GTO in 1986, as compared to Shuttle, Ariane, Titan, and Atlas-Centaur which, only in a multiple payload configuration, would probably launch at $10,000 to $15,000 per pound. TCI felt therefore confident and eager to enter the market "if its ability

TCI's action took the form of a May 1984 petition before the Office of the United States Trade Representative (USTR). It was the first time that this influential U.S. Government agency, responsible for negotiating trade agreements, was involved with international competition in the commercial space launch market.[137] With its petition TCI sought Presidential action under Section 301 of the Trade Act of 1974 against all individually named ESA member states and their "space-related instrumentalities". Section 301 gives the USTR broad ranging powers to combat unfair trade practices by foreign Governments. More specifically, the Act gives USTR the power to impose sanctions against countries that have unfairly restricted U.S. trade, including trade in services.[138]

to compete for launch customers is not undermined by the unfair and discriminatory commercial practices by the named European governments in the emergence of the private launch services industry. " See Before the Office of the United States Trade Representative, Chairwoman, Section 301 Committee, *Petition seeking Presidential Action under Section 301 of the Trade Act of 1974*, as amended (19 U.S.C. Sec. 2411, *et seq.*) filed on behalf of the civil expendable launch vehicle services industry by Transpace Carriers, Inc. against the Governments of Belgium, Denmark, France, Germany, Ireland, Italy, the Netherlands, Sweden, Spain, Switzerland and the United Kingdom and their space-related instrumentalities (May 25, 1984).

137. The Office of the US Trade Representative was created by Congress in the Trade Expansion Act of 1962 and implemented by President Kennedy in Executive Order 11075 on January 15, 1963. Initially named the Office of the Special Trade Representative this Agency was authorized to negotiate all trade agreements programs under the Tariff Act of 1930 and the Trade Expansion Act of 1962. As part of the Trade Act of 1974, Congress established the Office as a Cabinet-level agency within the Executive Office of the Presidentand gave it other powers and responsibilities for coordinating trade policy. In 1980, the Office was renamed the Office of the United States Trade Representative (USTR). President Carter's Executive Order 12188 of January 4, 1980, authorized the USTR to set and administer overall trade policy. The USTR was also designated as the nation's chief trade negotiator and as the representative of the U.S. in the major international trade organizations. The head of USTR is a Cabinet-level official with the rank of ambassador. William E. Brock III was the Trade Representative at the time of the TCI case, see History of the USTR, <http://www.ustr.gov/history/index.htm> (Mar 11, 1998).

138. See Sec. 2411 "(a) Mandatory action (1) If the [USTR] determines ... that (A) the rights of the [US] under any trade agreement are being denied, or (B) an act, policy, or practice of a foreign country (i) violates, or is inconsistent with, the provisions of, or otherwise denies benefits to the [US] under any trade agreement, or (ii) is unjustifiable and burdens or restricts [US] commerce; the Trade Representative shall take action authorized in subsection (c) of this section, subject to the specific direction, if any, of the President regarding any such action, and shall take all other appropriate and feasible action within the power of the President that the President may direct the Trade Representative to take under this subsection, to enforce such rights or to obtain the elimination of such act, policy, or practice ... (3) Any action taken under paragraph (1) to eliminate an act, policy, or practice, shall be devised so as to effect goods or services of the foreign country in an amount that is equivalent in value to the burden or restriction being imposed by that country on [US] commerce.

(b) Discretionary action. If the Trade Representative determines ... that (1) an act, policy, or practice of a foreign country is unreasonable or discriminatory and burdens or restricts [US] commerce, and (2) action by the [US] is appropriate, the Trade Representative shall take all

According to TCI, it was particularly the French national space agency, Centre National d'Etudes Spatiales (CNES), which subsidized the activities of Arianespace through practices which included:

"- The two-tiered pricing of launch services offered by Arianespace. Member States of ESA have agreed to pay 25% to 33% per launch more than is charged to the export market for the same services.
- The provision of launch and range facilities and services and/or personnel at no charge, or unreasonably low cost, to Arianespace by the French national space agency, CNES. The cost of launch and range facilities and services represents approximately one-third of the total cost of a launch.
- The provision of CNES administrative, management and/or technical personnel to Arianespace either at no charge or at rates that are unreasonably low.
- The subsidization of mission insurance rates which Arianespace customers would otherwise pay."

Thus, TCI argued, Arianespace, as a beneficiary of such subsidy practices, had been able to offer launch services to U.S. companies and third country customers "at rates which are substantially less than those charged to Member States of ESA and substantially below those prices Arianespace would be able to charge in the absence of subsidization". This unfair competitive advantage had resulted in lost sales to the petitioner and price suppression, if not depression, of bid prices.
Consequently, TCI asked the President to seek the immediate discontinuance of the above practices and, pending such action, to retaliate by prohibiting the Arianespace U.S. sales company from advertising and marketing its services in the U.S. and by imposing economic sanctions against the goods and services of the Member States of ESA.
The USTR initiated an investigation on July 9, 1984 of ESA's and France's policies and practices with respect to Arianespace.
One year later, on July 22, 1985, the U.S. President announced his "determination under Section 301 of the Trade Act of 1974", which read as follows:

> appropriate and feasibele action authorized under subsection (c) of this section, subject to the specific direction, if any, of the Presiden tregarding any such action, and all other appropriate and feasible action within the power of the President that the President may direct the Trade representative to take under this subsection, to obtain the elimination of that act, policy, or practice." Subsection (c) lists as authorized actions: to suspend, withdraw, or prevent the application of, benefits of trade agreement concessions to carry out a trade agreement with the foreign country concerned, impose duties or other import restrictions on the goods and fees or restrictions on the services of, such foreign country for such time as the Trade Representative considers appropriate, or enter into agreements with such countries committing the latter to end the practices, eliminate the restrictions or provide compensatory trade benefits".

"... Pursuant to Section 301 (a) of the Trade Act of 1974, as amended (19 U.S.C. 2411 (a)), I have determined that the practices of the Member States of the European Space Agency (ESA) and their instrumentalities with respect to the commercial satellite launching services of Arianespace S.A. are not unreasonable and a burden or restriction on U.S. commerce. While Arianespace does not operate under purely commercial conditions, this is in large measure a result of the history of the launch services industry, which is marked by almost exclusive government involvement. I have determined that these conditions do not require affirmative U.S. action as this time. But because of my decision to commercialize expendable launch services in the United States, and our policies with respect to manned launch services such as the shuttle (STS), it may become appropriate for the United States to approach other interested nations to reach an international understanding on guidelines for commercial satellite launch services at some point in the future."[139]

In the findings which formed the basis for the above determination, many of the factual allegations of TCI were said to be unsupported by evidence on the record. While other allegations were substantiated, the practices, in the view of the President/USTR, were not sufficiently different from U.S. practice in this field to be considered unreasonable under Section 301. The Presidential Determination looked at the various issues raised from the following three angles: *government inducements* to purchasers of Arianespace's services, direct and indirect *government assistance* to Arianespace, and *Arianespace's costs and pricing policies*.

Cost and pricing

This item addressed TCI's complaint that the ESA member states had to pay some 25% more for their (*i.e.* ESA payload) launches than foreigners. In that connection TCI quoted the pertinent statement of Arianespace's President at a Washington conference in 1982 to the effect that "European payloads are paying during the first three years of the STS pricing policy some 25% more than export sales to help us balance a bit this subsidy." In TCI's view this excuse ("we fight the subsidized shuttle") for a subsidy was not tenable, as the market segment in which Arianespace was operating was not so much the same as the shuttle's, but rather the one in which TCI was trying to make a living with its newly acquired Delta. So it was the U.S. private ELV industry which was targeted and hurt by this government-supported transfer price policy. As the Arianespace order book for launches as of May 21, 1984, showed that fully half of these launches were being carried out for participating European states, there was a virtual one-on-one subsidy for each non-European launch. "And, unlike TCI, Arianespace is virtually guaranteed a market, *i.e.*, the satellite launches made on behalf of participating European nations."

139. The President, *Determination under Section 301 of the Trade Act of 1974*, Memorandum for the United States Trade Representative of July 17, 1985, 50 Fed. Reg. 29631 (Jul 22, 1985).

The latter aspect, that of a - possibly - *protected home market*, received separate and more detailed attention on the part of USTR, who came to the following conclusion, worthy of being quoted in full because of the comparison between the U.S. and European 'home markets':

"ESA and its member states have agreed to give Arianespace a preference over other launch service providers with respect to payloads owned and operated by these government entities. Because of this preference and because almost all European communication satellites are operated by governments, rather than private firms, U.S. ELV's and the shuttle (STS) have limited opportunities to penetrate the European market. In contrast, much of the U.S. market, which is the major market in the world, is open because communications satellites are owned and operated by private sector firms.
However, U.S.G[overnment] payloads also are carried almost exclusively by U.S. launch service providers. Thus there is little difference in the respective treatment by ESA and the Unted States of government payloads. The major difference is in the structure of the market with European communication satellites being operated primarily by government entities."

(On the other hand, the so-called 'fly U.S.' policy, effective until today, reserves a much bigger government market for US launch providers than the European policy does for Arianespace, see Chapter 3.4.4 on this issue). The European pricing policy, and more in particular the cross-subsidization practices, was one that the USTR could not condemn: "[u]nder current pricing policies, Arianespace is not recovering its full costs, nor is it likely to do so in the near future.", USTR said, but, while acknowledging that ESA had agreed to long-term, fixed-price contracts with Arianespace and the latter consistently charged less to non-ESA customers, the U.S. investigator also remarked that "... it is not uncommon for firms to discount heavily in order to establish themselves in the market, especially when demand is low. Therefore, it appears that market forces, especially the current excess supply of launch capacity, are primarily responsible for current low launch prices."[140]

Range services

Though TCI had found reason to allege that launch range services were made available to Arianespace (virtually) free of charge USTR observed that in fact the latter company paid CNES a fee for the use of range services at Kourou, French Guyana, including personnel, but noted that this fee was arbitrary and

140. Arianespace disagreed with the above conclusion that is was not recovering its full costs; a senior official contended that Arianespace was recovering all costs except for a portion of launch range expenses, but including that for hardware and operations. Arianespace's lower operational costs (lower than Shuttle and US ELV's) resulted from the fact that the Ariane rocket was unmanned and expendable, used existing ELV technology, and placed orders for boosters at the rate of 6 or 7 per year thus benefitting from economies of scale, see Raclin, *supra* note 59, at 51, note 79.

did not cover the full range costs incurred by that launch company. However the commercial ELV's also received U.S. government range services and launch support on a direct cost, rather than full cost reimbursement basis (as the Commercial Space Launch Act prescribed: the 1988 amendment of the Act would define 'direct cost' as "the actual costs that can be unambiguously associated with a commercial launch effort, and would not be borne by the Unites States Government in the absence of a commercial launch effort."[141]

Administrative personnel and services

TCI complained that CNES personnel was made available to Arianespace under a Head Office Services Agreement to perform various administrative functions, such as legal and fiscal, personnel, management, quality assurance, etc., "on terms that do not comport with normal commercial practice." According to TCI, Arianespace would pay CNES 0.3% of its after-tax revenue, and since Arianespace reported no revenue in 1980, it made no payments to CNES in that period, and "it is likely that the cost to Arianespace for such services in 1981 to date continue to be unreasonably low."[142]

USTR did not agree with the petitioner: "While the fee is arbitrary, we have no reason to question CNES' assertion that the fee, in fact, covers actual wage costs plus fringe benefits. The amounts paid to date seem reasonable."

Mission insurance

TCI described its experience with the subsidization of insurance rates offered by Arianespace in a confidential exhibit. Whatever its contents, USTR, under the heading "Government Inducements" found no evidence of offsets or insurance being provided by ESA or its member states: "Member States of ESA do provide export financing for Arianespace's customers. However the terms of the financing are consistent with international agreements to which the United States is a party."

141. See Sec 15 (b)(1)/(2614)(b)(1) as amended, CSLA, *supra* note 84. The text of the unamended part of the provision reads: "In the case of any acquisition of launch services, including utilities, the amount of such payment shall be an amount equal to the direct costs (including salaries of [US] civilian and contractor personnel) incurred by the [US] as a result of the acquisition of such launch services."

142. The first European launch under Arianespace's responsibility took place in 1981. In the years preceding the TCI case the following launches took place: four "qualification flights": Dec 12, 1979, May 23, 1980, Jun 19, 1981, Dec 20, 1981; four flights in the "promotion series": Sep 9, 1982, Jun 16, 1983, Oct 18, 1983, Mar 4, 1984, and one "commercial flight", under official Arianespace responsibility, on May 23, 1984, See *Reaching for the skies: The Ariane family story and beyond*, ESA BR-42, Netherlands (1988) hereinafter referred to as Reaching for the skies, at 11.

Additionally, USTR investigated whether any (other) direct government assistance was given to Arianespace in the form of, for instance, loans and capital grants.
No evidence was found of either ESA or the individual member states providing soft loans or direct capital grants to Arianespace. Of course, the stockholders, some of whom were government-owned, *e.g.* Aerospatiale, put up equity capital, but USTR had no reason to suggest that these transactions were inconsistent with commercial practice. Arianespace also obtained some *hardware* from ESA at less than the cost of acquisition, but then NASA's agreement with TCI for the transfer of the Delta program also provided for transfer of certain flight hardware at less than the government's cost of acquisition.

Finally, one form of possible *indirect government assistance* was addressed, to wit, that governments through their ownership of major suppliers, who are at the same time also major stockholders of Arianespace, could artificially reduce Arianespace's operating costs. However, the investigation did not uncover evidence to suggest that Arianespace was obtaining significant assistance by reason of low-cost inputs from its suppliers.

The Presidential Determination finally observed that, since there were no international standards of reasonableness for launch services, they had no choice but to compare ESA practices to U.S. practice and to reasonable commercial practices. On that basis it concluded that the ESA practices were not sufficiently different from those of the U.S. to be actionable under Section 301. However, a word of caution was added to this conclusion:

"This determination is not an endorsement of ESA practices.
Our policies in this area are now undergoing revision, and in the future we may wish to reexamine ESA's practices and their effect on U.S.G. launch services.
At that time it may be in our mutual interest to engage in international discussions aimed at establishing appropriate guidelines for the commercial launch industry."

The interesting aspect of these concluding remarks is not so much that the USTR, with the blessing of the President, kept its options open for the future; after all, in 1985, both the launch industry and the respective U.S. government policies were in a state of flux and Arianespace's competition hurt its U.S. counterparts. So, to keep open a basis for talks about "appropriate guidelines" concerning competitive practices was a prudent precaution. Remarkable is, however, the reference in the above quoted text to the effect of ESA's practices on "U.S.G[overnment]" launch services. *TCI* complained about European behaviour, not NASA. U.S. private ELV's were threatened, not the space shuttle.
As will be seen later, in Chapter 3.4.3, such discussions did take place eventually, triggered by the market entry of other, *i.e.* non-U.S., non-European, launch providers.

In that connection it should be noted that Arianespace's marketing strategy was considered very agressive by its American counterparts, because the company consistently underbid the subsidized shuttle and was thus successful in attracting customers who were (supposed to be) traditional users of the shuttle, such as Intelsat and several U.S. companies.[143] Ironically, as Arianespace's launch pricing was keyed to compete with the shuttle price, that company had as much reason to complain about the artificially low level thereof as the U.S. ELV companies. In fact, ESA's participation in the TCI investigation was made conditional on receiving information on the price structure of the shuttle; and on the basis of that information ESA vigorously objected to NASA's interpretation of "full cost recovery" and the ensuing clear element of subsidization present in congressionally approved shuttle pricing. No doubt, the strong views of the ESA member states on this matter, and their lobbying for higher shuttle prices, played an important role in USTR's final report on the subsidization of Arianespace, and would also influence those countries' position in their discussions with the U.S. on competition guidelines.

For the time being, however, U.S. government policies and practices, and the resulting regulatory and competitive conditions in the period 1983-1986, prevented the private U.S. launch firms from entering the international commercial launch market.

2.2.3 The post-Challenger regulatory environment

In the 'interim' period 1983-1986, the U.S. private ELV industry's competitive position remained unsatisfactory, both vis-a-vis the space shuttle and its foreign competitor Arianespace. And, although there appeared to be general recognition of the unfeasibility of having both the private industry and the shuttle cater to the same commercial market, the positions were frozen to the particular disadvantage of the ELV providers until the fatal date of January 28, 1986, when an explosion destroyed the space shuttle Challenger, killing its entire crew of seven, destroying its payload, and grounding the system for more than two and a half years.[144]

143. See Harry R. Marshall, *U.S. space programs: cooperation and competition from Europe*, Address April 17, 1985, Dept of State Bull.83-87 (Sep 1985), at 84-85. At the time of this address, Arianespace had already launched 2 Intelsat 5 satellites, and, a.o., a Brazilian and an Arab satellite; its order book reportedly totalled nearly USD 875 million, covering firm launches of 28 satellites, of which 6 ESA satellites, 10 other European satellites, 6 US satellites and 6 spacecraft from non-European, non-US sources, *ibid.*

144. The Challenger payload consisted of a NASA Tracking and Data Relay Satellite (TDRS-B) and the Spartan (Sptn-Halley) ultraviolet telescope to study comet Halley, see *Space Almanac*, Anthony R. Curtis ed., USA (1992) at 108. On Feb 3, 1986, Reagan announced the formation of a Presidential Commission to investigate the cause of the accident. The Commission was chaired by William Rogers, former Secretary of State under Pres. Nixon.

The accident not only crippled the military and intelligence community's launch programs, but also caused serious damage to the civilian (communications) satellite manufacturers and operators with shuttle launch contracts: all agreed launch dates had suddenly become uncertain at best (though NASA continued to assure its customers that their launches would remain on the launch manifest, nobody could tell when the system would be operational again). Moreover, the satellites were designed and built for the shuttle only and would need hard and software adaptation to make them fit for ELV launching, causing at least substantial delays and cost increases. Worse, the above policies of the government and its agencies, in stead of producing a healthy number of competitive companies with a range of products fit, willing and able to meet the demands of their eager customers, had resulted in a limited offer of ELV launch services, patently insufficient to take care of all civil and military launch needs.[145] Worse still, 1986 was a bad launch year, with a number of launch failures, increasing both the launch back log in general and, because of DOD's preemptive procurement of ELV's and launch facilities, costly delays for the private satellite industry in particular.[146] Finally, although Arianespace was in principle more than willing to take over the clients from its U.S. competitors, that company itself, on May 31, 1986, suffered a launch failure as well, causing the loss of an Intelsat V satellite, and would not launch again until close to one and a half year later.[147]

Other members included astronauts Neil Armstrong and Sally Ride (the first American woman in space, and crew member on two previous shuttle flights in 1983 and 1984), Robert Hotz, former Ed.-in-Chief, AW/ST, and several distinguished scientists and engineers including a Nobel laureate. The Commission finalized its work on June 6 1986 and issued a report of that date which contained a detailed analysis of the cause of the accident and provided NASA with nine major recommendations of a technical and organizational nature. Recommendation 8 read as follows: "NASA must establish a flight rate that is consistent with its resources. *The nation's reliance on a single launch system should be avoided in the future.*" (emph. add.), see Space Shuttle 1996, *supra* note 51, at 279-280. For more detailed information on the flight, the accident, the Commission's analysis and recommendations and NASA's follow-up, resulting in a thoroughly refurbished (and safer) shuttle Endeavour, launched in Sep. 1988, see *id.*, at 277-284).

145. In his article prepared shortly before the accident, Raclin quoted Under Secretary of the Air Force Aldridge as stating: "Were the Orbiter fleet to be grounded for just six months in the early 1990s, it would take the nation two years at the nearly impossible surge rate of thirty flights per year to catch up. Moreover, if an Orbiter were lost, we could never catch up.", see Raclin, *supra* note 59, at 66, note 158.

146. On April 16, 1986, a Titan 34D launch from Kennedy Space Center failed, resulting in the loss of launch capability for approximately 9 months for two launch pads, see Commercial Space Launch Act Amendments of 1988, H.R. Report 100-639, H.R. Committee on Science, Space, and Technology, 100th Cong., 2d Sess. (May 1988), H.R. 100-639, hereinafter referred to as H.R. CSLA Amendments Report, at 10. Additionally, on May 3, 1986 NASA had to destroy a Delta launcher, carrying a weather satellite, which had become uncontrollable. See Fought, *Legal aspects of the commercialization of space transportation systems*, 3 High Tech. L. J. 99-147 (1989), hereinafter referred to as Fought, at 100.

147. Both before and after that date some former shuttle customers contracted with Ariane space

Surprisingly it still took more than 6 months before the first political reaction and sign of change was given. Reason for this delay was the heated interdepartmental debate on post-Challenger launch policies which raged all through the first half of 1986, with DOT and DOC pitted against NASA. The former argued that the shuttle be removed totally from the commercial launch market to give the ELV industry a clear signal that there would be no more competition on the part of government agency NASA: the only way of getting the industry to produce desperately needed launch services at all. It was clear to many - even prior to the accident - that the needs of the military and scientific community were of such magnitude that the shuttle's unique capabilities should be reserved for, and would be fully used by, those missions alone and that for all other fast growing uses a full-fledged ELV system was indispensable.

NASA nevertheless had great difficulty accepting a departure from its traditional activities in the commercial launch market and put up a determined fight to be allowed to resume the whole range of launch tasks after the return of the shuttle. Partly as a result of the pressure of a number of highly frustrated, important shuttle-users with shuttle launch contracts but no prospect of any launch taking place soon, the private launch industry finally got what it wanted.

In August 1986, President Reagan announced a Directive which, apart from proclaiming the decision to build a fourth shuttle orbiter to replace the Challenger, for all practical purposes ended NASA's role in launching commercial and foreign satellites.[148] The decision, although simply reflecting the reality of a fully booked shuttle manifest, and not meant specifically to promote the ELV industry, was nevertheless hailed by DOT Secretary Dole as a "turning point in the space program" and one which created a "natural division of work", leaving NASA and the shuttle with building and operating the space station (announced in 1984), planetary exploration, experimenting with new business opportunities in materials processing and meeting defense needs, and saving a share of the international launch market for the U.S. through its private launch firms.[149]

for a switch to an Ariane launch of their payload, see *Ibid.*

148. *Fourth Orbiter and the space program*, statement by the President, August 15, 1986, 22 Weekly Comp.Pres. Docs 1103-1104 (1986), later formalized in U.S. Launch Strategy, National Security Decision Directive (NSDD) 254, Dec 27, 1986, enacted in [NASA] Authorization Act, FY 1991, Pub.L.101-611, Nov. 16, 1990, 104 Stat. 3190, Sec. 112:
"(1) It shall be the policy of the United States to use the Space Shuttle for purposes that
(i) require the presence of man,
(ii) require the unique capabilities of the Space Shuttle or
(iii) when other compelling circumstances exist.
(2) The term "compelling circumstances" includes, but is not limited to, occasions when the [NASA] Administrator determines, in consultation with the Secretary of Defense and the Secretary of State, that important national security or foreign policy interests would be served by a Shuttle launch."

149. See Scarborough, *supra* note 130, at 24.

At the time of the decision to off-load commercial satellites, reached without any prior consultation with the U.S. satellite communications industry, 44 companies held shuttle launch agreements with NASA.The President's new shuttle policy left the government with the problem of what to do with these commercial payloads. As a result of inter-agency deliberations, NASA, in October 1986, announced a new shuttle manifest of commercial payloads which was comprised solely of 20 payloads which met the criteria set forth in the Presidential policy: five of these had national security implications, twelve had foreign policy implications (*i.e.* satellites of foreign governments), and three were shuttle-unique. The remaining customers were told that, as the new manifest represented the shuttle launch schedule through calender year 1994, there would be no chance of a launch for years to come anyhow, and they were reminded of their right to terminate the launch agreement on that basis.[150] In fact, the government hoped that these disappointed customers would voluntarily seek launch opportunities elsewhere, *i.e.* either - and preferably - by the U.S. ELV providers or - if unavoidable - by the foreign competitors. The accident and the ensuing government actions thus created two groups of unhappy customers: one, remaining on the manifest, whose launches were seriously and indefinitely delayed, the other, removed from the manifest and therefore forced to immediately look elsewhere. At least one of the customers belonging to the second group tried in vain to get its satellite upgraded to 'national security' status, and some companies would sue the government for breach of contract.[151] Twenty-two satellites out of the above forty-four were under construction at the time the presidential directive was released. The damages to these companies in most cases exceeded USD 100 million on an individual basis, as a result of such expenses as non-usable shuttle-unique hardware, software, equipment and documentation, storage costs for unlaunched spacecraft, and more-than-doubling launch and insurance costs.[152] An even more serious impediment to overcoming the (damage of) delays for these companies was noted at Congressional hearings on the state of the U.S. launch industry in the autumn of 1987,[153] to wit, that, over a

150. See American Satellite Co. v. U.S., No.525-89C, 26 U.S. Cl. Ct. 146 (1992), reprinted in Gorove U.S. Space law, *supra* note 55, at I.A.5 (29).

151. American Satellite Co. did both, see *supra* note 150. Hughes Communications also went to Court on the matter, see Hughes Communications Galaxy, Inc. v. United States, 26 Cl.Ct. 123 (1992) reprinted in Gorove US Space law, *supra* note 55, at 1.A.25 (28). In both cases the Court would reject the claim. In the later (Hughes) case, the Court held that the Presidential decision to end commercial use of the shuttle ... to eliminate all purely commercial satellites from the manifest, was a sovereign act which prevented NASA from honoring its obligations under the launch contract so there was no breach of contract on the part of NASA. On appeal, the decision was reversed, and the government was held liable for breaching the launch contract, see 998 F. 2d 953 (Fed. Cir. 1993) and 34 Fed. Cl. 623 (1995).

152. See H.R. CSLA Amendments Report, *supra* note 146, at 7.

153. See *State of the commercial launch industry*, Hearings before the Subcommittee on Space Science and Applications, House Committee on Science, Space and Technology, 100th

year following the President's announcement of the new policy, no U.S. satellite manufacturer or operator had succeeded in obtaining a fixed cost or firm launch date for a launch with an American launch provider. The U.S. government, in its role of manager and controller of the launch ranges, was blamed for this cost and schedule uncertainty. As we have seen above, the priority given to government launches and the uncertainties created with respect to liability and insurance requirements (the latter primarily the result of the Air Force refusing to accept the authority of DOT to provide the necessary guidelines) effectively blocked the entry of private industry into the launch market; and President Reagan's Directive had not settled these issues.[154]

The hearings were initiated because of growing concern about the prospects for the shuttle's timely recovery and the negative impact of the 'no access to space' situation on both national security (aging 'spy' and other military or intelligence satellites needed urgent replacement) and the U.S. commercial communications satellite manufacturers (whose ability to sell satellites was severely handicapped by the unavailability of any means of transportation to their orbital positions). As one author remarked about the results of the hearings, "the message was mixed - on the one hand, the House Committee learned that the industry had stepped forward with significant financial investments and commitments, but, on the other, policy impediments were hindering industry's ability to compete ... The biggest problem looming to both providers and customers was the potential risk of liability."[155] In this connection mention was made of the onerous liability and indemnity conditions and the priority for government launches embodied in the AF model ELV commercialization agreement discussed above. It became apparent that as long as the U.S. government maintained this cost and scheduling uncertainty, there was little chance for the ELV industry to ever become an effective competitor of existing and prospective - subsidized and supported - foreign launch providers, such as Arianespace, but also the Soviet Union, China and Japan.

In testimony at the hearings before the Congressional Committee, the following major issues were identified as needing resolution if the U.S. was going to have a commercial launch industry to assure access to space for government and commercial users.[156]

Cong., 1st Sess. (Sep 1987).

154. In the meantime, in January 1987, the Air Force did conclude a procurement of medium launch vehicles for which proposals were required to include a commercial launch vehicle derivate. "The procurement was a significant and innovative effort in utilizing the government's buying power to incentivize the commercial launch industry.", See H.R. CSLA Amendments Report, *supra* note 146, at 3.

155. See Trippett, *supra* note 94, at 51.

156. For the following discussion, see, in greater detail, H.R. CSLA Amendments Report, *supra* note 146, at 4-8.

Government role: the government had obligations and responsibilities as
(1) regulator of the U.S. launch industry,
(2) owner and manager of launch ranges,
(3) signatory to the Space Liability Convention which potentially confers absolute liability on the U.S. for damage caused by private citizens' space activities,
(4) user of the commercial launch industry to assure access to space for government purposes,
(5) historically, the sole U.S. provider of launch services for government and commercial users.
These roles and ensuing responsibilities justified an active government partnership with the launch industry to make the latter commercially viable.

Policy continuity: where DOT, under the Commercial Space Launch Act, had principal responsibility for regulating the industry, it was important that it continued to actively consult with all departments and agencies concerned to keep the implementation of the Act's policies consistent (also in the face of perceived evolving roles of these various agencies concerned).

Use of government ranges: U.S. government launch ranges must be considered a national asset, not the property of an agency. The conditions for the use of these ranges were critical for the foreseeable future to the survivability of the launch industry. The latter needed predictability and reliability in cost and schedules. Commercial requirements must be considered a national priority on government launch ranges and conditions should reflect that policy to create confidence in the commercial launch industry.

Foreign competition: the U.S. industry entered a highly competitive international marketplace for launch services, with Arianespace, launching nearly 50% of the world satellite market in 1985, and China and the Soviet Union actively marketing (but not yet *selling*) their launch services to the West. Foreign government support came in many forms, such as two-tier pricing, charging less than full cost for launch facilities, services and insurance, preferential customs treatment, packaging (*i.e.* cross-subsidies among satellites, launch services and ground stations to entice potential customers to buy the whole package at lower total prices) and preferential treatment (by governments or regional organizations) of domestic or regional launch providers. Without a predictable level of U.S. government support and consistent policy provided in the legislation, the U.S. launch industry would not be competitive.

Insurance requirements and risk uncertainty: both Arianespace and NASA had taken a risk allocation approach, with a reasonable share of the risk (and insurance) assumed by the client and the remainder by the agencies concerned. The private launch industry, however, carried the total burden of the risk (of unlimited liability) which created great uncertainty and a serious threat to that

industry. It was suggested that a risk sharing regime be introduced for the ELV industry similar to the shuttle precedent.

Impact of the President's decision to remove commercial loads from the shuttle: the U.S. satellite communications industry had relied on the availability of the shuttle. Its commitments should be recognized and, to the extent feasible, honored by the government to the extent these prior commitments could be applied to U.S. commercial launches. In other words, this highly important national industry needed special treatment to restore confidence in the government as a contractual party and to partly offset the damages incurred.

Research and development: foreign nations (European, Soviet, Chinese, Japanese) were actively supporting the development of new launch vehicle design capabilities that would challenge the competitiveness of the U.S. launch industry. Taking as an example NASA's successful role in aeronautical research and technology to the benefit of the U.S. aviation industry, Congress felt that a similar effort had to be made to foster advances in launch vehicle technology, in order for that industry to remain competitive.

During the long period of Congressional discussions, including two series of hearings, on the above issues, *i.e.* between August 1986 and April 1988, a number of other developments increased the momentum for change and, conversely, were influenced by those debates:

- President Reagan announced a new national space policy which also addressed the U.S. launch capabilities;
- The Air Force released a new model ELV commercialization agreement, and
- DOT-OCST published its final launch licensing regulations

Each of these development will be briefly reviewed hereafter. This paragraph will be concluded by a discussion of the CSLA Amendments of 1988.

The new national space policy of February 1988

In August 1987, President Reagan ordered an inter-agency review of U.S. government space policy, which included, *inter alia*, a thorough analysis of previous Presidential decisions and the implications of the space shuttle and ELV accidents. The resulting *Presidential Directive on National Space Policy* of January 5, 1988, released on February 11, 1988[157] divided U.S. space

157. *The President's space policy and commercial space initiative to begin the next century*, Fact sheet, The White House, Office of the Press Secretary, Feb 11, 1988, announcing and explaining the National Security Decision Directive, signed by the President on January 5,

activities in three separate and distinct sectors: two strongly interacting governmental sectors (civil, and national security), and a separate non-governmental commercial sector. (This was in fact the first time that the Administration clearly identified a separate and distinct commercial space sector.)
The Directive followed this distinction by detailing the government's policies under the following headings:
- civil space policy and civil space sector guidelines
- national security policy and national security space sector guidelines,
- inter-sector (national security and civil space) policies and guidelines.
- commercial space policy and commercial space sector guidelines.

Space transportation received prominent attention in the Directive. Clearly the major purpose of the governmental policies was to create assured access to space, sufficient to achieve all U.S. space goals, but more in particular, and as a matter of priority, to serve governmental goals. The Challenger trauma was primarily a governmental trauma, and the text and spirit of the Directive reflected that aspect. Thus, as an inter-sector policy, the following statement was made:

"United States space transportation systems must provide a balanced, robust and flexible capability with sufficient resiliency to allow continued operations despite failures in any single system. The goals of [U.S.] space transportation policy are: (1) to achieve and maintain safe and reliable access to, transportation in, and return from, space; (2) to exploit the unique attributes of manned and unmanned launch and recovery systems; (3) to encourage to the maximum extent feasible, the development and use of [U.S.] private sector space transportation capabilities without direct Federal subsidy; and (4) to reduce the costs of space transportation and related services."

The civil space sector guidelines, primarily directed at NASA, reconfirmed, under the "civil government space transportation" - heading, the governmental use of the STS space shuttle for shuttle-unique purposes and projects.
The national security space sector guidelines, primarily directed at DOD, paid particular attention to the spreading of risks and the maintainance of launch capabilities in all circumstances:

"Payloads will be distributed among [manned and unmanned] launch systems and launch sites to minimize the impact of loss of any single launch system or launch site on mission performance. *The DOD will procure unmanned launch vehicles or services* and maintain launch capability on both the East and West coasts ...
DOD will study concepts and technologies which would support future contingency launch capabilities." (emph. add.)

1988, hereinafter referred to as the 1988 National Space Policy (partially) reprinted in Space law and related docs, *supra* note 112 at 581-585.

Space transportation guidelines, addressing both national security and civil space needs and concerns falling under DOD and NASA responsibilities, confirmed that the government launch needs would be met by a mix of vehicles, consisting of the STS, unmanned launch vehicles (ULV's) and in-space transportation systems. For its own purposes, DOD was directed to assure, in coordination with NASA, the shuttle's utility to national defense and to integrate missions into the shuttle system. Coordination with NASA was necessary for this joint use as operational control of the shuttle and mission management would be in the hands of the agency of the mission concerned. This switching of responsibilities was already provided for in a NASA/DOD MoU on the matter.

The Directive confirmed that the commercial launch operations were an integral part of a "robust national space launch capability". Therefore, NASA, contrary to its own wishes,[158] was prohibited from maintaining an ELV fleet adjunct to the shuttle.
In fact, all civil government agencies were directed to use, as much as possible, the ELV services of the domestic commercial launch industry, or of DOD. As we saw in the above quoted, and emphasized, national security guideline, only DOD was required/permitted to have its own in-house launch vehicles. With them it would thus be able to offer launch services to other government agencies in competition with U.S. private industry.

The Directive also listed specific guidelines for the federal encouragement of commercial ULV's, *inter alia*:
- the use of government launch facilities was encouraged, but
- government priority use to meet "national security and critical mission requirements" was maintained, with the obligation to minimize the impact thereof on commercial operations,
- no subsidization, but (development and competition) 'encouraging' pricing of government facilities, equipment and services,
- NASA and DOD should provide access to their launch facilities on a reimbursable basis, and develop, in consultation with DOT, contractual arrangements covering such access by commercial launch firms; they should also provide technical advice and assistance to commercial launch firms on a reimbursable basis,
- pricing of the above services to be based on "direct cost" incurred by the government.

158. Shortly after the Challenger explosion, NASA had announced plans to - again - assemble its own 'in-house' ELV fleet, see Glenn H. Reynolds and Robert P. Merges, *Toward an industrial policy for outer space: Problems and prospects of the commercial launch industry*, 29 Jurimetrics J. 7-42 (Fall 1988), hereinafter referred to as Reynolds Merges, at 16.

A fifteen point Commercial Space Initiative which formed part of the new national space policy contained two provisions of major importance to the private industry, one which - again - directed Federal agencies to "procure existing and future required [ELV] services directly from the private sector to the fullest extent feasible", and another which finally addressed the insurance concerns of the U.S. commercial launch industry using Federal launch ranges, by promising administrative steps including:

"- *Limits on third party liability*: Consistent with the Administration's tort policy, the Administration will propose to Congress a $200,000 cap on noneconomic damage awards to individual third parties resulting from commercial launch accidents;
- Limits on property damage liability: The liability of commercial launch operators for damage to government propertyresulting from a commercial launch accident will be administratively limited to the level of insurance required by the [DOT].
If losses to the Government exceed this level, the Government will waive its right to recover for damages. If losses are less than this level, the Government will waive its right to recover for those damages caused by Government willful misconduct or reckless disregard."

Though Congress would later support the Administration's above approach on government property damage, it rejected the idea of tort reform by capping pain and suffering damages at USD 200,000, and would instead opt for a risk-sharing formula based upon the NASA model. Still, the President's initiative showed a willingness to protect the launch industry against unlimited liability, and with Congress opting for a similar approach, there was reason to be optimistic about the chances for the creation of a 'private-launch-firm friendly' regulatory environment.

Finally, the Directive contained an undoubtedly well-meaning, but curiously selective contribution towards the damage incurred by the off-loaded shuttle customers, in the form of so-called "vouchers for research payloads":

"NASA and [DOT] will explore providing to research payload owners manifested on the Shuttle a one time launch voucher that can be used to purchase an alternative U.S. commercial launch service."

Congress would not endorse this approach but instead opted for a different measure which compensated *all* shuttle customers, though to a more limited extent.

The revised USAF model ELV commercialization agreement of February 1988

The AF model agreement was revised in early 1988. It showed a number of improvements, partly in letter, partly in spirit, to the advantage of the user,

though it still reflected the oligopoly position (together with NASA) of this governmental provider of the "property, facilities, goods and services".[159]
One could say that the revised agreement, in a number of ways, honoured the pro-commercial ELV language and spirit of the Act of 1984 and the prevailing Congressional views as expressed during the September 1987 hearings, and distanced itself from the 'just be happy you're allowed to use our launch site' attitude shown by its predecessor.
Thus, in contrast with the latter, it:

- specifically referred to the authority of the Commercial Space Launch Act,
- promised that "[t]he Government will make all reasonable efforts to minimize adverse impacts its actions may have on commercial operations and accord commercial users a high degree of stability in conducting their commercial launch business.", and
- promised that, where a government permission or authorization was required the Government wouldl act promptly and not impose unreasonable conditions.[160]

The provisions on the allocation of risks, liability and insurance were of course the crucial items.
As we saw above, the original model agreement obliged the user to obtain insurance protecting himself, the government and its (sub) contractors from any third party liability and (own and government) property damage liability, at amounts as required by the DOT Secretary. At the same time, the user was to indemnify the Government and hold it harmless against liability for claims by third persons, including employees of the user, for death, personal injury, damage to or loss of (user's or government or other) property, including liability for fines or costs arising out of any violation by the user of government regulations.
The original agreement did not address the question of how much of the user's exposure could in fact be insured and at what price, nor did it suggest, in case the actual claims exceeded the insured amount, who would pay.
The revised agreement created the concept of (third party and property damage) liability and insurance for a specific launch up to "the amount of the maximum available insurance", *i.e.*:

"The amount of insurance available in the world market at a reasonable premium and on terms considered commercially reasonable for the risks involved to fund the User's responsibilities under this Agreement, or a special provision of this Agreement."[161]

159. See Department of the Air Force, *Expendable launch vehicle commercialization, Model agreement*, revision one, February 1988, hereinafter referred to as USAF revised model agreement 1988 or revised agreement, reprinted in Space law and related docs 1990, *supra* note 112, at 547-563.
160. See artt. I and II respectively of the revised agreement, *supra* note 159.
161. See art IV b.3. of the revised agreement, *ibid.*

To the extent that Government damages and/or third party claims arising in connection with a specific launch exceed the amount as defined above, "questions of liability between parties and responsibility for paying claims will be left for resolution according to the applicable law of the U.S. (*e.g.* tort law, the Federal Tort Claims Act)". In other words, 'we'll cross that bridge when we come to it!'

It would be up to the Government to determine what the maximum available insurance for a specific launch would be and which price would be considered reasonable for that product. That decision would be final and not be subject to appeal. That provision in itself and the uncertainty about the possible outcome of such determinations did not bring about the desired feeling of stability on the part of the launch industry, though the fact that in the end it would most probably be the OCST setting the standards and Congress watching over the behaviour of all departments concerned, created at least some sense of comfort on the part of the industry.

Also in another way the revised agreement was somewhat kinder to the launch firms. The original provision on "support interruptions", *i.e.* that the launch ranges ("Centers") will act in good faith and negotiate to minimize scheduling and support conflicts, was supplemented by a new commitment which expressed the "government's intention to accord commercial users a high degree of stability in conducting their commercial launch business."[162] What remained was the ground rule in case of conflict (the established policy since 1983),[163] namely that the Government had priority in the use of government property and support services to meet national security interests or U.S. Government mission requirements. To discourage 'easy' claims in that field and address the consequences for the industry, the revised agreement added that the government decision to exert its first priority rights had to be made by the Center commander, and provided also:

"In the event the Government asserts its first priority right, the Government will make its best effort to coordinate with the User in advance (except in emergency situations when the Government must act immediately) so that the User may adjust its work schedules to minimize the impact of an interruption."[164]

Of course, the fact that the government retained its first priority right without even having to weigh the interests of and consequences for private enterprise was far from reassuring, particularly where another provision absolved the Government in advance from any liability for any costs, including but not

162. See art. XII of the revised agreement, *ibid.*
163. See ELV Commercialization Directive, *supra* note 70, at 712, reconfirmed in the 1988 National Space Policy, *supra* note 157.
164. See art. XII b.1. of the revised agreement, *ibid.*

limited to consequential damages incurred by third parties, the user, its contractors, or subcontractors as a result of such interruptions.
One should not forget, however, that this subordinate role of the commercial users followed to a large extent from the wording of the Commercial Space Launch Act itself, which, under the heading "Use of government property" provided:

"The Secretary shall take such actions as may be necessary to facilitate and encourage the acquisition ... by the private sector of launch property of the United States *which is excess or is otherwise not needed for public use* and of launch services, including utilities, of the United States *which are otherwise not needed for public use*." (emph. add.)

On the same basis, the department of the Air Force introduced an additional provision, which enabled the Government, without liability for any resulting costs, to terminate the agreement in its entirety on a thirty days notice in case

"[r]equirements are developed for critical, conflicting national security or other governmental launches or launch activities which cannot be reasonably satisfied by such means as schedule adjustment, and therefore preclude the Government from making available to the User, as excess capacity, all or substantial portions of the Government facilities and services otherwise provided for in this Agreement."[165]

The traumatic experience of the military and intelligence community with the breakdown of the space shuttle and the failures of the ELV 'back-ups' in the 1986 disaster year undoubtedly contributed to the 'me first' letter and spirit of the above clauses. Nevertheless, it conflicted sharply with the prevailing (Presidential and Congressional) mood, as the ensuing amendments to the Act would show.

The final DOT-OCST launch licensing regulations of April 1988

The licensing regulations for commercial launch activities which OCST published on April 4, 1988[166] did not differ much from the interim regulations in force since early 1986. This was partly a result of the Department's close consultation, through COMSTAC, with the launch industry. Also the detailed attention paid to the numerous comments received by OCST on its Policy Statement which preceded the interim regulations and of OCST's growing experience with the launch industry positively affected the quality of the regulations. In addition, OCST observed, "much progress had been made since the interim regulations were published in developing the contractual arrangements covering access of commercial launch firms to

165. See art. XIV a.4. revised agreement, *ibid.*
166. See OCST Licensing Regulations, *supra* note 97.

government-developed launch technology and government-provided safety services."[167] OCST noted with satisfaction the President's Space Policy's "emphasis on commercial launch services as an integral element of the robust transportation capability essential for maintaining [U.S.] space leadership". Observing with concern the potential capacity problems at the national launch ranges caused by the demands of the three space sectors, OCST still tried, in consultation with NASA and DOD, to get a fair share of access to these facilities (on reasonable terms) for the private launch sector commensurate to the latter's new 'official' position. This included 'encouraging' pricing of the facilities and the establishment of "allocation of risk principles and insurance requirements that are appropriate for commercial launch activities conducted at national ranges."[168] Obviously, the revised USAF model ELV agreement had not settled all commercial issues satisfactorily.

The Department of Transportation at the same time remained firmly committed to the concept of deregulation, applied so successfully to domestic aviation and pursued with determination in international aviation relations.[169] And, like aviation, the space transportation industry was to be regulated primarily to guarantee safety of operations, and with as few other administrative burdens as possible.

Thus, the final regulations contained a number of clarifications and simplifications, but no material changes in philosophy or approach or provisions substantially changing the rights and obligations of the industry or others concerned. (Though the planned amendments to the Commercial Space Launch Act of 1984 were at the same time, in April 1988, the subject of Congressional fine tuning, the final licensing regulations could formally only be based on the CSLA as it stood).

Consequently, these licensing regulations:

- continued to apply to all U.S. commercial or non-commercial, manned or unmanned space launches, except launch activities of the U.S. government and amateur rocket activities: the latter, which number annually in the millions, are subject to state and local regulation and self-regulation by the sponsoring organizations concerned;
- maintained, for unmanned launches, the system of two reviews, the safety review and the mission review (commercial manned launches would eventually require different and/or additional reviews);

167. *Id.*, Supplementary information: background.
168. *Id.*, Supplementary information: national space launch infrastructure.
169. In 1978, the U.S. adopted a policy of deregulation of domestic air transport by phasing out government regulation and, *inter alia*, 'sunsetting' the Civil Aeronautics Board. At the same time, the idea of international deregulation and more free competition in the international air transport market was embraced, resulting in the conclusion of more liberal bilateral air transport agreements, see the Airline Deregulation Act of 1978, P.L. 95-504, 92 Stat. 1705 (Oct 24, 1978) and the International Air Transport Competition Act of 1979, P.L. 96-192 [S. 1300] (Feb 5, 1980).

- provided, in general terms, for the possibility of operating a commercial launch site, in a way comparable to the operation of a commercial airport, but without detailed (safety and other) provisions to that effect;
- provided for *mission* approval "unless some element of the proposed launch poses a threat to U.S. national security or foreign policy interests, constitutes a hazard to public health and safety or safety of property, or is inconsistent with international obligations of the [U.S.]" (Sec.411.7 (a))
- provided for *safety* approval, which, in case of the use of a Federal launch range, will ordinarily be given "once the applicant has been accepted by a range or site capable of handling the launch activity proposed." (Sec. 411.5 (b));
- introduced the obligation for the licensee to submit to the Office, in accordance with article IV of the 1975 *Convention on registration of objects launched into outer space*[170] specified information on the vehicle and object launched (Sec. 415.10);
- contained more detailed requirements with respect to the information to be submitted to the Office in support of the license application, particularly safety-related information when it concerned launches from non-Federal or non-OCST-licensed launch sites.[171]

Limitation of liability: the 1988 amendments to the CSLA

The September 1987 hearings on the state of the commercial launch industry, and more in particular the testimony received at that occasion from representatives of the U.S. launch and satellite communications industry, created sufficient concern on the part of members of the House Subcommittee

170. Art. IV para. 1 of that Convention reads: "Each State of registry shall furnace to the Secretary-General of the United Nations, as soon as practicable, the following information concerning each space object carried on its registry:
(a) Name of Launching State or States;
(b) An appropriate designator of the space object or its registration number;
(c) Date and territory or location of launch;
(d) Basic orbital parameters, including: (i) Nodal period, (ii) Inclination, (iii) Apogee, (iv) Perigee;
(e) General function of the space object". See Convention on registration of objects launched into outer space, opened for signature at New York, Jan 14, 1975, U.S. ratification deposited Sep 15, 1976 (TIAS 8467) e.i.f. (for the U.S.) Sep 15, 1976; text in Space law and related docs 1990, *supra* note 112, at 73-80.

171. *Id.*, Appendix [to the licensing regulations] - commercial space launches: information required for applications.
The suggestion of the House Committee on Science and Technology, to introduce license application fees, was supported by OCST, but it took another three years to formalize this administrative detail: Sec. 413.5 (d), providing for the payment of a non-refundable fee of $2,500.00 upon submission of the application, was introduced through an amendment of the regulations, at 56 FR 41068 (Aug 19, 1991).

on Space to introduce legislation addressing the main impediments the industry was confronted with.[172]

The bill and the resulting Act amending the Commercial Space Launch Act of 1984 came into force on November 15, 1988. It adopted a risk-allocation model along the lines of the Shuttle and Ariane arrangements, and, in a number of other ways, improved and strenghtened the position of the commercial launch industry:

Limitation of liability

The bill set overall maximum liability amounts and insurance requirements for the launch industry of USD 500 million for third party damage and USD 100 million for government property damage. In that connection and for the purpose of establishing the individual requirements per licensee, the concept of "maximum probable loss" was used. Thus, each licensee had to obtain liability insurance or demonstrate financial responsibility (self insurance) in an amount sufficient to compensate the maximum probable loss as determined for each licensed launch activity by the DOT Secretary, up to an amount not exceeding the lesser of the above figure or the "maximum liability insurance available on the world market at a reasonable cost."[173]

The concept, first proposed by the aerospace industry in a January 1988 position paper, was based on the distinction between (a) the "probable

172. See *To facilitate commercial access to space, and for other purposes*, H.R.3765, 100th Cong., 1st Sess., Dec 15, 1987. The bill was discussed at a second series of the hearings in February 1988, after which a new version, incorporating the comments received from the Administration and the industry witnesses, was drafted (mark-up of April 14, 1988). On April 18, 1988, a clean bill, H.R. 4399, was introduced incorporating the amendments adopted by the Subcommittee. H.R. 4399 was thereupon approved by the full Committee on April 21, 1988, see H.R. CSLA Amendments Report, *supra* note 146. The Senate Committee on Commerce, Science and Transportation considered its own - largely identical - version of the bill, S.2395, on May 13, 1988, and, in the same month, reported favorably on the final draft, see S.Report 100-593, 100th Cong.,2d Sess. (1988), hereinafter referred to as Senate Amendments Report.

173. See Sec. 16. a(1)(A) of the Act as amended: "Each license issued or transferred under this Act shall require the licensee or transferee - (i) to obtain liability insurance, or (ii) to demonstrate financial responsibility, in an amount sufficient to compensate the maximum probable loss (as determined by the Secretary, after consultation with the Administrator of [NASA], the Secretary of the Air Force, and the heads of other appropriate agencies) from claims by a third party for death, bodily injury, or loss of or damage to property resulting from activities carried out under the license in connection with any particular launch. In no event shall a licensee or transferee be required to obtain insurance or demonstrate finacial responsibility under this subparagraph, with respect to the aggregate of such claims arising out of any particular launch, in an amount which exceeds (I) $500,000,000 or (II) the maximum liability insurance available on the world market at a reasonable cost, if such insurance is less than the amount in subclause (I)." An identical text governed the maximum probable loss from claims "against any person by the [US] for loss of or damage to property of the [US]" with a limit of $100,000,000, Sec. 16. a(1)(B).

maximum" loss and (b) the "maximum possible" loss. Where for the former insurance would, in the experience of the industry, in principle be available at reasonable cost, the latter, involving that extraordinary incident which rarely, if ever, occurs, but cannot be totally ruled out, was generally *un*insurable. Therefore, the industry had recommended that the NASA approach be followed to the effect that the commercial party which benefited from the launch would be responsible, through insurance coverage, for what was considered the probable maximum loss resulting from that launch, and the Government would assume the potential but extremely unlikely excess-of-insurance liability risk of the maximum possible loss.[174] Apart from the above, the bill also provided for the licensee to enter into "reciprocal waivers of claims" with its (sub) contractors, customers and (sub) contractors of customers, under which

"each party to each such waiver agrees to be responsible for any property damage or loss it sustains or for any personal injury to, death of, or property damage or loss sustained by its own employees resulting from activities carried out under the license."[175]

And a further provision authorized the DOT Secretary, on behalf of the U.S. government, its agencies, personnel and (sub) contractors to also enter into reciprocal waivers of claims with the parties involved in the launch. Such an agreement would make each party responsible for the losses, damage or injuries it incurred, to the extent that claims exceeded the insurance for government property damage (of at most USD 100 million).

The bill required the respective insurance policies of the private parties concerned to protect the U.S. government and its agencies (by naming these authorities as co-insured) *at no cost to the U.S.* Thus, one could say, the *quid pro quo* was: the U.S. government was, together with the industry, protected through insurance against the financial consequences of maximum probable loss, and the industry was protected by the U.S. Government against any losses insofar as they exceeded those maximum insured amounts.
The original bill, approved by the House, provided for government liability for the excess above the insured amount without any limitation whatsoever. In view of the unlimited State liability for damage caused by space objects contained in the Space Liability Convention of 1972, this made perfect sense. Nevertheless, the administration, as we saw above, had different views on the matter and preferred legislation which would only place a cap on non-economic damages. To assume all liability above a certain amount in its view amounted

174. See *U.S. commercial space transportation risk allocation and insurance* - an AIAA position paper, January 1988, reprinted in 16 (1) J. Space L. 110-115 (1988).
175. See Sec. 16(a)(1)(C).

to a form of unwarranted government subsidization of the launch industry which could trigger requests for similar treatment from other industries.[176] Faced with the possibility of a veto of the whole bill because of this particular aspect, the Senate approved two amendment to the bill, one which limited the government's indemnification exposure to USD 1.5 billion per incident and another which would terminate the indemnification authority of the government five years after its enactment, *i.e.* on November 15, 1993.[177] The two amendments re-introduced, at least to some extent, elements of uncertainty into the indemnity regime. First, the total amount of damage to third parties 'insured' for the launch industry was thus established at USD 2 billion. This implied that compensation for any damage exceeding that amount would have to be paid by the industry again. Though the risk can be seen as rather theoretical, it is there, and cannot be totally ignored. Secondly, though the U.S. aerospace industry, encompassing both the satellite manufacturers and the launch industry, would probably be able to mount an effective counterattack to any Presidential or Congressional intent not to extend the above indemnification scheme, the provision introduced the explicit possibility for a change in the system - and thus uncertainty for the industry - in the period after November 1993. (Congress did extend the above termination date to January 1, 2000).[178] The legislation contained yet another element of uncertainty with respect to the payment of claims by the government: in any such case (where the government indemnification scheme will likely become effective), the President will have to submit a "compensation plan" to Congress, which will be acted upon by the Senate. Whether or not, and if so to what extent the Senate will support this compensation plan is difficult to predict. The Act as amended states,

"[t]o the extent provided in advance in appropriations Acts or to the extent there is enacted additional legislative authority to provide for the payment of claims as submitted in the compensation plan outlined in paragraph (4), the Secretary shall provide for the payment by the [U.S.] of successful claims ... of a third party against the licensee ..."

and requires for a compensation plan, in paragraph 4, that it

176. See Trippett, *supra* note 94, at 53-54.
177. Sec. 16 (b)(1): the amount of $1.5 billion may be increased with additional sums necessary to reflect inflation occurring after January 1, 1989. Sec. 16 (b)(5) provides the following 'sunsetting' language with respect to government indemnification: "The provisions of paragraphs (1) through (4) shall apply only to each license issued or transferred under this Act for which a complete and valid application has been received by the Secretary prior to the date that is 5 years following the date of enactment of the [CSLA] Amendments of 1988".
178. By Publ. L. 102-588, Sec. 503 (NASA Authorization Act FY 1993) (Nov. 4, 1992). The subject provision was recodified at 49 USC Sec. 70113(f) (Title 49, 'Transportation', as revised by Publ. L. 103-272 (July 5, 1994).

"(i) outlines the aggregate dollar value of such claims; (ii) recommends sources of funding to pay for these claims; and (iii) includes any legislative language required to implement the compensation plan or plans if additional legislative authority is required."[179]

As one author remarked with respect to the effect of the above provisions, "the amended Act does not compel the Congress to comply with the undertaking to indemnify. As a result, any incident that triggers the possibility of indemnification must be considered at the time with no assurance now that it would actually be forthcoming."[180]

Preemption

The Amendments addressed a number of other concerns of the industry (and of DOT), one of which was the possibility for the government agency concerned to 'preempt' the commercial launches from the launch facilities. Although in the revised USAF model ELV commercialization agreement the 'absolute' right of preemption had been deleted, the government's priority in the use of its property and support services "to meet national security interests or U.S. government mission requirements" had been retained (without any liability on the part of the government for any consequential damages). The government's reaction to the shuttle accident had shown the serious consequences of these provisions for the launch industry and the shuttle clients. And these injured private parties had made their views heard at the hearings, resulting in a provision in the bill which tightened the criterion to be met to justify a preemption and contained 'stern' follow-up obligations for the agency concerned:

-the bill prohibited government preemption of agreed licensed commercial launches, "except in cases of imperative national need.";

-only the Secretary of Defense or the NASA Administrator could make such a determination of imperative national need, in consultation with the DOT Secretary, with no delegation possible;

-the same high officials were to report to Congress within 7 days after any such determination, with "an explanation of the circumstances justifying such determination and a schedule for ensuring the prompt launching of a preempted payload"[181]

The original bill introduced in the House also contained a provision which would have obliged the preempting agency to pay a predetermined amount of liquidated damages included in the license, in the event the preemption did not take place because of an imperative national need. This provision was later deleted. The proposal did however evidence the clear intention of Congress

179. See Sec. 16 (b)(1) and 16 (b)(4)(B) respectively

180. See Peter D. Nesgos, *Commercial space transportation: A new industry emerges*, 16 Annals Air & Space L. 393-421 (1991) hereinafter referred to as Peter Nesgos 1991, at 412.

181. See Sec. 7 of the 1988 Act, amending Sec. 15(b) of the CSLA, by adding new para. (4)(A).

that commercial customers "should not be faced persistently with second class status."[182]
The Amendment in its final version did provide the licensee preempted from access to a launch site or launch property with the guarantee that he would not have to pay to the U.S. "any amount for launch services solely attributable to the scheduled launch prevented by such preemption.", presumably meaning: no bills have to be paid by the launch provider for the services rendered by the agency concerned until and including the preemption.[183]

Incentives to 'bumped' shuttle customers
As discussed above, the House Committee felt very strongly about the 'nonchalant' way in which the 44 shuttle launch contracts had been dealt with by the government in the aftermath of the Challenger accident. To restore the confidence of the industry in the government as a *bona fide* contract partner, Congress agreed on a number of special measures for those 22 shuttle customers whose satellites were under construction at the time of the President's policy decision:
First, for the commercial launch of these so-called "eligible satellites" (by U.S. private launch provider) the requirement to take out insurance for government property damage was waived ; secondly, the customers concerned would not have to pay for the government (launch range etc.) support services provided in connection with the commercial launch of an eligible satellite.
The term "eligible satellite was defined" as

"... a satellite that-
(1) was under construction on August 15, 1986;
(2) was the subject of a launch services agreement or contract with [NASA], which as of August 15, 1986, was in effect and not yet carried out; and
(3) is licensed for launch under the Commercial Space Launch Act ..."[184]

The 'direct cost' of the above government launch support services were calculated by NASA and the Air Force to range between USD 1 and 3 million, depending on the type of launch vehicle used. The Congressional Budget Office (CBO) assumed that, of the 22 eligible satellites, some might never be launched and others would use foreign launch firms. (Gu)estimating that some 8 satellites would indeed be launched from government ranges, the CBO expected the federal government to lose receipt of roughly USD 10 million

182. See Trippett, *supra* note 94, at 53.
183. Yelton, *supra* note 120, has a different interpretation: "... the launch provider is not required to pay for any *additional* launch services.", at 135 (emph. add.).
184. See Sec. 6(a)-(c), CSLA Amendments 1988, *supra* note 103, amending Sec. 16, CSLA.

over the next two years, the price of its largely symbolic gesture vis-à-vis the shuttle customers.[185]

Development of international guidelines on market access and competition

The Congressional hearings had brought an acute awareness on the part of the legislators of the various ways in which foreign launch providers, incumbent and prospective, subsidized and assisted their launch industries. In that connection, both the European practices (see also the findings in the TCI case) and Soviet and Chinese appeals to sell launch services to the West were noted with concern. (In 1987-1988 both China and the Soviet Union had already offered their services to manufacturers and operators of U.S.-built satellites; the national security, foreign policy and commercial ramifications thereof would lead to intense internal (inter-agency) discussions and, in autumn 1988, to Congressional hearings on the matter. This will be discussed in the next Chapter).

The latter competitive threat to the U.S. launch industry revealed, in the view of the House Committee, a real need to develop a Western policy toward the use of non-western launch services. "Unless U.S. decisions are made in an international context, U.S. launch vehicle and satellite industries may lose opportunities involving western commercial satellite competition."[186]

Put differently, a U.S. launch policy vis-a-vis China and the Soviet Union could be rendered ineffective if Europe did not concur with and support that policy. And some international guidance on competitive launch practices was also called for. Hence the inclusion of a new Section in the Act which expressed the sense of the Congress that the U.S.

> "should explore ways and means of developing a dialogue with appropriate foreign government representatives to seek the development of guidelines for access to launch services by satellite builders and users in a manner that assures the conduct of reasonable and fair international competition in commercial space activities."[187]

The resulting regulatory environment

The clear division of U.S. space activities, introduced by the U.S. president in 1988 and supported by Congress, into two main sectors, the governmental (civil, and national security) and the non-governmental commercial space sector, had thus led to distinct launch policies for each sector.

U.S. government launch needs would be met by the mix of vehicles available, *i.e.*, at the choice of the agency concerned, the shuttle (operated by NASA),

185. See H.R. CSLA Amendments Report, *supra* note 146, at 22.
186. See *id.*, at 17.
187. See Sec. 9 "Commercial space launch service competition" CSLA Amendments 1988.

government ELV's (owned and operated by DOD) or the private launchers (ELV's owned and operated by the U.S. private launch industry).
As all civil government agencies were directed to use the ELV services of the industry or of DOD as much as possible, the launch industry continued to compete with both NASA and DOD, *but only in the government payload market*. Congress, in 1990, went a step further by adopting legislation which required NASA "to purchase launch services for its primary payloads from commercial providers whenever such services are required in the course of its activities".[188] (The above provision, directed only at NASA, was expanded by the Commercial Space Act of 1998 (H.R. 1702), passed by Congress on October 9, 1998, to cover *Federal* (*i.e.* including DOD) acquisition of space transportation services. The relevant provisions will be reviewed in Chapter 3.4.4 *infra*.
The international and domestic commercial payload market remained out of bounds for these government agencies. The U.S. private launch industry had thus to contend only with its successful foreign competitor Arianespace.
The CSLA Amendments of 1988, providing for limited liability, for the use of government facilities and services on a "direct cost" basis, and for governmental restraint in preempting commercial launches, had, to a large extent, levelled the playing field. What remained was the clear headstart of Arianespace in the international commercial market built up in 5 years of agressive marketing in competition with the space shuttle.
What remained also was the right of the government not to grant, *c.q.* to revoke or suspend, a commercial launch license for reasons of national security or foreign policy. The combination of this right with existing satellite and missile (technology) export controls had major consequences for both the U.S. launch and the U.S. satellite manufacturing industry, and would play an important role in the competitive relations with all, but particularly the new, foreign launch providers.

2.3 Satellite and missile technology export controls: effects on launch market access

Introduction

"... nonproliferation of weapons of mass destruction and missiles is central to our national security strategy. I think there is no higher priority on the President's agenda or that of the

188. See Launch Services purchase Act of 1990, Sec. 201-205, Pub.L. 101-611 (NASA Authorization Act 1991 (Nov 16, 1990). The congressional findings (Sec. 202) contain pro-competitive and pro-(US) private enterprise language including: "(3) the interests of the [U.S.] will be served if the commercial launch industry is competitive in the international market place; (4) commercial vehicles are effective means to challenge foreign competition; ... (8) predictable access to [NASA] launch markets would encourage continuing [US] private sector investment in space and related activities".

Secretary of State or the Secretary of Defense and others than to impede the flow of dangerous technologies around the world and to prevent the acquisition of nuclear, chemical, or biological weapons or missiles by more countries. That means both strenghtening the global regimes--the treaties and supplier regimes that constrain those technologies. Also it means detailed, day-by-day enforcement on the ground, and we're very active in both areas.[189]

The above statement, made in early 1998 by a senior State Department official, succinctly sums up the worries and corresponding responsibilities felt by the U.S. government since the end of the cold war. Similarly, the International Strategic Plan published by the Department in September 1997 lists the foreign policy goals of the U.S., mentioning first of all the goal to "[s]ecure peace ; deter agression; prevent, defuse, and manage crises; halt the proliferation of weapons of mass destruction; and advance arms control and disarmamant."[190] Hence, those countries which, for various reasons, are seen as posing a threat to U.S. security, should not be able to obtain any arms, whether the above weapons of mass destruction or advanced conventional weapons or the technology to make, or improve the effectiveness of, those weapons, including advanced computer hard and soft ware and encryption. Of course, the 'enemy' of today is not the same as yesterday's nor is the weapons' provider the same over the years.
In early 1998, Iraq, North Korea and Iran were identified by the State Department as countries trying to acquire weapons of mass destruction and their delivery systems and/or the technology to build these weapons and systems. India and Pakistan belonged to the same category. Russia and China were seen as countries of concern because of their role as producers and suppliers of such weapons (technology) to the above countries. According to the State Department:

"... very real concerns persist about the porosity of Russia's military-industrial infrastructure and the prospect for unauthorized transfers of materials, equipment, know-how, and technologies. The leakage of missile technology and expertise from Russia's industries to Iran has underscored this serious proliferation concern."[191]

189. John Holum, Acting Under Secretary for Arms Control and International Security Affairs, *Special briefing on trip to China* (Apr 9, 1998) <http://www.state.gov/www/policy_remarks/1998/980409_holum_china.html>, hereinafter referred to as Holum briefing, at 1.
190. See Phyllis E. Oakley, Ass. Secretary of State for Intelligence and Research, *Assessing current and projected threats to U.S. national security*, Testimony before the Senate Select Committee on Intelligence, 1-14 (Jan 28, 1998) <http://www.state.gov/www/policy_r.../1998/980128_oakley_security.html>, hereinafter referred to as Oakley testimony, at 1.
191. See *id.*, at 3.

The legal means used by the U.S. to prevent such unauthorized transfers involving the above countries, including re-exports of U.S. origin items from foreign destinations to third countries, are of a domestic and international character. U.S. laws originating from the cold war period and multilateral arrangements of the U.S. and its friends and allies, both regularly updated and adapted to changes in geopolitical and military/security circumstances, try to stem the flow of weapons around the world, with particular attention being paid to specific (categories of) countries and to specific uses, the so-called "end-users or end-uses of concern".

The effectiveness of the national export control regulations is enhanced by their being maintained as part of *multilateral* control arrangements. In turn, the multilateral arrangements create the need for (amendments to) national laws on the subject. Well-known arrangements in this connection are the *Nuclear Suppliers Group*[192], the *Australia Group* (chemical and biological weapons),[193] the *Coordinating Committee for multilateral export controls*

192. The Nuclear Suppliers Group (NSG) was formed on the initiative of the U.S., following the 1974 nuclear explosion by India. The primary purpose was to ensure that suppliers uniformly applied a comprehensive set of guidelines to ensure that nuclear cooperation did not contribute to proliferation, and to involve a key supplier and non-member of the Nuclear Nonproliferation Treaty, France. By early 1978, when its guidelines and control list were published, NSG membership had grown to 15 countries. The NSG did not meet throughout the 1980s, but resumed doing so in 1991, with annual meetings taking place since then leading to a strengthening of controls and a membership of 34 at the end of 1996. In 1992, spurred on by revelations about Iraq's illicit nuclear weapons program, the NSG adopted controls on nuclear-related dual-use goods, for example those with both nuclear and non-nuclear applications, that could make a major contribution to unsafeguarded nuclear activities or to nuclear explosive activities. NSG cooperates with the International Atomic Energy Agency, which publishes the former's guidelines, incl. "Guidelines for transfers of of nuclear-related dual-use equipment, material and related technology", see *Multilateral nuclear export control regimes*, ACDA fact sheet, <http://www.acda.gov/factshee/exptcon/nuexpcnt.htm > (Dec 17, 1996).

193. The Australia Group (AG) is an informal forum of states, chaired by Australia, whose goal is to discourage and impede chemical weapons (CW) and biological weapons (BW)(together CBW) proliferation by harmonizing national export controls on CW precursor chemicals, BW pathogens, and CBW dual-use production equipment, sharing information on CW proliferation developments, and seeking other ways to curb the use of CBW; these actions are complementary to provisions of the 1925 Geneva Protocol, the 1972 Biological and Toxins Weapons Convention, and the 1993 Chemical Weapons Convention. The Group was formed in 1984 as a result of CW use in the Iran-Iraq War. Membership in late 1996 came to 30 states: Argentina, Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Slovak Republic, Spain, Sweden, Switzerland, U.K. and U.S. The European Union also participates in the meetings. The Group has no charter or constitution and operates by consensus. The Group has established common export controls for chemical and biological weapons nonproliferation. For CW, members of the AG control 54 chemical precursors as well as specified CW-related production equipment. For BW, members have established export controls on certain micro-organisms, toxins and equipment that could be used in a BW program. The Group has issued an informal "warning list" of dual-use CW precursors, bulk

(Cocom) and its successor the *Wassenaar Arrangement* (conventional weapons and 'dual-use' goods and technologies) and the *Missile Technology Control Regime* (MTCR).
The application of these unilateral and multilateral regulations has had a continuing - in some ways unintended and undesirable - effect on the trade in launch services in cases where either the payload or the launch vehicle, or component thereof, happened to fall under any of the above regimes.
The discussion hereafter will focus in particular on the interaction between pertinent U.S. laws, policies and practices and the Cocom, Wassenaar and MTCR arrangements, and on their combined effect on the launch trade.

2.3.1 The export controls of the Department of State and Commerce

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

The Arms Export Control Act of 1976 (AECA or the Act)[194] authorizes the U.S. President to control the export and import of so-called defense articles and defense services. The Act establishes the principle that licensing decisions with respect to these articles and services, also traditionally referred to as "munitions", are to be made "in furtherance of world peace and security and foreign policy of the United States". In other words, the respective licensing decisions should not be based primarily on commercial or business interests, but on foreign policy and national security grounds. The rationale for this approach is a simple one: thou shalt not arm thy (tomorrow's) enemy!

The statutory authority of the President to promulgate regulations in this respect was delegated to the Secretary of State[195] and on that basis, the Department of State issues the so-called *International Traffic in Arms Regulations (ITAR)*[196] which contain export licensing provisions and a

chemicals, and CW-related equipment. Members develop and share the warning list with their chemical industry and ask it to report on any suspicious transactions. Within the State Department, the Arms Control and Disarmament Agency (ACDA) participates in U.S. delegations to bilateral discussions, to the annual AG plenary meetings in Paris, and to periodic meetings of technical experts, as well as in the internal policy process of the U.S. government, see ACDA Annual Report 1995, Chapter 6 <http://www.acda.gov/reports/chap6.htm>.

194. See Sec. 38, Pub. L. 94-329, 90 Stat. 729 (Jun 30, 1976), 22 U.S.C. 2778.
195. See Executive Order No. 11,958, 42 Fed. Reg. 4,311 (1977).
196. ITAR, November 1989, based on Dept Reg 108.840, 49 FR 47684, Dec 6, 1984, Department of State Publication 9793, Bureau of Political-Military Affairs, 22 CFR 120-130 hereinafter referred to as ITAR 1989; amended in 1993, Part II, 58 (No. 139) FR 39279-39326 (Jul 22, 1993), hereinafter referred to as ITAR 1993; amended in 1996, 61 FR 48830 (Sep 17, 1996), hereinafter referred to as ITAR 1996. For the March 1999 ITAR amendments, see Ch. 4.1.2.4.

description of the defense articles and services concerned. Designations of defense articles and services are based primarily on whether an article or service is deemed to be *inherently military* in character or has a predominantly military application. The fact that an article or service may be used for both military and civilian purposes ("dual-use") does not in and of itself determine whether it is subject to the ITAR export controls.

Designation

Such designations are made by the Department of State with the concurrence of the Department of Defense. The items so designated constitute the United States Munitions List (USML).[197] If an article is placed on the Munitions List, its export is regulated *exclusively* by the Department of State. The above regulations are primarily administered by the Director of the *Office of Defense Trade Controls (ODTC),* formerly the Office of Munitions Control within the Bureau of Political-Military Affairs of the Department.[198]

197. See ITAR 1989 *supra* note 196 Part 121.

198. The Bureau of Political-Military (formerly Politico-Military) Affairs (PM), which reports to the Under Secretary for Arms Control and International Security Affairs, advises the Secretary and other Department principals on security and defense issues worldwide, including arms control negotiations, non-proliferation of weapons of mass destruction and the means to deliver them, regional security arrangements, programs for selected foreign security assistance, conventional arms sales, peaceful uses of nuclear energy and nuclear reactor safety, dual use and technology transfers, and international space issues involving military systems and controlled technologies. The Bureau is also responsible for licensing and regulating commercial exports of military equipment and services, see the U.S. Department of State: Structure and organization, released by the Bureau of Public Affairs, May 26, 1995 <http://www.state.gov/www/about_state/dosstruc.html (23-4-98)>
Prior to an internal reorganization of State in 1993, PM shared its responsibilities with other Bureaus within State such as the Economic Bureau and the Bureau of Oceans, Environment and Science, for nuclear, 'dual use' (see later) and other export controls. The reorganization brought all the above responsibilities together under PM, further increasing its export licensing work load (in 1993, it was already the major processor of such licenses within the government, with 50,000 'munitions' licenses per year versus 26,000 licenses at Commerce). The 1993 changes also reflected a reorientation in export control priorities for strategic trade, from the old NATO versus Warsaw Pact focus to the new emphasis on regional security and non- proliferation.
The State Dept wields considerable, and often decisive power over (international) space policy and space relations with foreign countries. As a result, clashes with other departments and agencies which also have responsibilities in the space field, such as DOT, Commerce, Defense and NASA, are not uncommon. The issue of (the application of) export controls is one on which Commerce and State have frequently disagreed, see 4 (3) Space News (Jan 1993) at 4, 8, 21, and *infra*. As a result thereof the latter Dept put gradually more emphasis -in spirit and procedure - on finding a better balance between its interest in the prevention of exports that might contribute to proliferation on the one hand and the promotion of legitimate exports that help US industry and the economy on the other hand. Commerce, traditionally, and notwithstanding its own tasks in the field of export controls, had a stronger focus on export promotion.

Again, the Department of State determines -but not without having consulted an inter- agency panel in which Defense plays a crucial role and, when it is a space item, also NASA - whether an article or item will be placed on the Munitions List or, as a somewhat lesser or more debatable risk to national security, should be put on the Department of Commerce's "dual-use" Commodity Control List or Commerce Control List (CCL), bringing the commodity concerned under the export control regulations of the latter Department and its Bureau of Export Administration (BXA). (See para. 2.3.1(ii) hereafter).

Commodity jurisdiction

If an exporter is in doubt about the character of his product and about the proper licensing authority he may request the Office of Defense Trade Controls to provide a determination on that product.[199] ODTC will, if necessary, consult with other agencies concerned (Defense and Commerce) and then make a jurisdictional determination. A company may use the same procedure to ask that an item or product be moved from State Department to Commerce Department jurisdiction.(Such removal of an item from the USML to the CCL is a matter for Congressional review!) ODTC regularly publishes overviews of commodity jurisdiction determinations to provide general guidance to industry.[200]

Defense *articles* on the Munitions List include: *rockets, launch vehicles, spacecraft, including manned and unmanned, active and passive satellites and non-military communication satellites*, space electronics, launching and guidance equipment and all components, parts, accessories, attachments and associated equipment specifically designed or modified for the above items.[201] (On the removal from the USML, and subsequent re-introduction into the List, of commercial communications satellites, see *infra*, Ch. 4.1.2.4).

Defense *services* are defined as:

a) the furnishing of assistance, including training, to foreign persons in the design, engineering, development, production, processing, manufacture, use, operation, overhaul, repair, maintenance, modification, or reconstruction of defense articles, whether in the United States or abroad; or
b) the furnishing to foreign persons of any technical data, whether in the United States or abroad.

199. See ITAR 1996 *supra* note 196 at Sec. 120.4.
200. See Defense Trade News, quarterly of the Bureau of Political-Military Affair, Dept of State, *passim*.
201. ITAR 1989, *supra* note 196 at Sec. 121.1.

"technical data" in this connection means *inter alia* classified information relating to defense articles and defense services and any information directly related to the design, engineering, development etc. of defense articles, including for example information in the form of instructions, computer software and documentation).[202]

Export, in ITAR terminology, means sending or taking defense articles or technical data outside of the United States in any manner, disclosing or transferring technical data to a foreign person, whether in the United States or abroad, the performance of a defense service on behalf of, or for the benefit of, a foreign person, whether in the United States or abroad, or "*transferring registration, control or ownership to a foreign person of any ... satellite covered by the United States Munitions List, whether in the United States or abroad*; ..." (emph. add.)[203]

The launch of a U.S. satellite *outside* the United States is therefore impossible without specific authorization from the Office of Defense Trade Controls in the form of an export licence. For that purpose, companies in the U.S. engaged in the business of either manufacturing or exporting defense articles or furnishing defense services are required to register with that Office. Such registration provides the Government with necessary information on who is involved in certain manufacturing and exporting activities and is generally a precondition to the issuance of any license or other ODTC approval.[204]

Prior to 1984, the year in which the Commercial Space Launch Act was passed, the Department of State, under the above definitions of *defense articles, defense services* and *export*, claimed that launches *from U.S. territory* also required an export license under the ITAR, provided the rocket left the (air space over the) three mile territorial waters. The primary reason for the State Department to apply the above regulations at the time, and for the other Departments to accept that role, had less to do with arms export control than with the Department's statutory responsibility for ensuring that the United States complied with its international obligations under the various treaties with respect to the exploration and use of outer space. Uncertainty, both on the part of the private launch industry and of the various governmental agencies concerned, about the rules to be applied and the agencies to be involved, also played a role.[205] Thus, the State Department employed the "export"

202. See ITAR 1989, *supra* note 196 at Sec. 120.8, 120.21).
203. See ITAR 1996 *supra* note 196 at Sec. 120.17; the 'ownership' criterion did not appear in the ITAR 1989.
204. ITAR 1989, *supra* note 196 at Sec. 122.1.
205. See Steptoe 1984, *supra* note 60, at 193: "No agency, however, appeared to have direct responsibility for licensing the actual launch. Consequently, a decision was made by members of a senior interagency group on space, operating under the aegis of the National Security Council, to rely upon the Department of State's authority under [Sec 38 of the

construction even though the Arms Export Control Act and the Munitions List were originally promulgated before rocket flight became a reality. The legality of requiring an export licence for private launches from a U.S. launch site was therefore questioned at the time (though a costly, lengthy challenge to the authority of State was not encouraged).[206]

The issue was resolved with the passing of the Commercial Space Launch Act in 1984, which made the D.O.T. the sole launch licensing authority within the federal government. In particular, Sec. 23 (a) of that Act (headed "Relationship to other law") provides: "A launch vehicle shall not by reason of the launching of such vehicle, be considered an export for purposes of any law controlling exports."
In December of the same year, the State Department revised its regulations to provide expressly that a *launch* in itself is not considered an export under the ITAR.[207]

The ITAR designate all launch vehicles, rockets and missiles and all spacecraft, including electronic equipment specifically designed or modified for spacecraft or spaceflight as "significant military equipment" (SME), *i.e.* articles for which special export controls are warranted because of their capacity for substantial military utility or capability. *Non-military communication satellites* are specifically excluded from this designation.

Prohibited exports and sales to certain countries
The Regulations single out a number of (categories of) countries for 'special' treatment. Thus,

AECA and the ITAR], as the umbrella authority under which the Federal Government would discharge its international and municipal legal obligations to authorize and supervise the proposed launch." DOT's Office of Commercial Space Transportation referred to the "uniqueness and urgency of the proposed launch" as the reason for SIG (space) to decide that ELV launches would be considered "exports" and thus be subject to ITAR. Utilization of ITAR was seen as an appropriate, though temporary, expedient for addressing most of the domestic and international issues raised by these launches. But OCST also noted that, as a regulatory apparatus for authorizing and supervising commercial launch activities, the ITAR proved to have significant limitations as none of the Federal agencies involved had developed either procedures for reviewing launch applications or criteria for granting approval. "As a result, the first private launch applicant was subjected to duplicative reviews and other complications that prolongued the licensing process", see DOT Policy Statement, *supra* note 92, at para. 3, Background.

206. On the various regulatory and political aspects of this question, see Chapter 2.2.1 and Myers 1984, *supra* note 62, at 47-48; Webber 1984, *supra* note 13, at 13-15; Straubel 1987, *supra* note 76, at 947.

207. See William B. Wirin, *U.S. restrictions on space commerce,* Proceed. 33d Colloq. L. Outer Space 120-132 (1990) hereinafter referred to as Wirin, at 121. ITAR 1996 *supra* note 196 Sec. 120.10 sub (e) now reads (in part): "A launch vehicle or payload shall not, by reason of the launching of such vehicle, be considered an export for purposes of this subcharter".

"it is the policy of the United States to deny licenses and other approvals with respect to defense articles and defense services destined for or originating in certain countries or areas. This policy also applies to exports to and imports from these countries or areas."

ITAR 1989 mentioned the following such countries, all belonging to the (then) Communist bloc: Albania, Bulgaria, Cuba, Czechoslovakia, East Germany, Estonia, Hungary, Kampuchea, Latvia, Lithuania, North Korea, Outer Mongolia, Poland, Romania, the Soviet Union and Vietnam. The above policy also applies to countries with respect to which the U.S. maintains an arms embargo, *e.g.* (in 1989) Angola, or "whenever an export would not otherwise be in furtherance of world peace and the security and foreign policy of the [U.S.]". Two other countries subjected to an arms embargo received special mention, namely South Africa, by virtue of a U.N. Security Council Resolution against apartheid, and Chile. Finally, the category of countries "that have repeatedly provided support for acts of international terrorism" was represented by Cuba, Iran, Libya, Syria, South Yemen and North Korea.[208] Though absent in ITAR 1989 from the above categories of countries, China, after the Tiananmen square incident, was also subjected to special export controls.

Depending on the developments within and relations with these countries, their names will disappear from this list, or new countries will be added as they become subject to the denial, suspension or revocation of licenses to export to them. For instance, in 1993 the State Department terminated the arms embargo against Angola, and the ITAR was amended accordingly. Similarly, in 1992, Liberia was included in the category of embargoed countries, resulting in a suspension of all Department of State export licenses, in compliance with a U.N. Security Council Resolution instituting a general complete embargo on all deliveries of weapons and military equipment to that country. The State Department, in 1993, clarified that the arms embargo imposed against South Africa in 1977 included the so-called "independent" homelands. And new export restrictions were imposed on Nigeria "to underscore the importance the [U.S.] attaches to an orderly and timely transition to unhindered elected civilian government, as well as to respect for human rights."[209] The end of the cold war also ended 'special treatment' for former Communist countries such as the Czech Republic, the Slovak Republic, Albania, Estonia, Latvia, Lithuania and Romania: as from early 1994, the State department would consider applications for the export of defense articles and services (USML items) to these governments on a case-by-case basis.[210] The

208. ITAR 1989, *supra* note 196, Sec. 126.1.

209. See 4 (3) Defense Trade News (1993) at 7(Angola), 3 (4) Defense Trade News (1992) at 6 (Liberia), (1-2) Defense Trade News (1993) at 5 (South Africa, and 7 (1) Defense Trade News (1996) at 2 (Nigeria). Such amendments of ITAR will be published in the Fed. Reg.

210. See 5 (2) Defense Trade News (1994) at 17. As of June 26, 1994, the list of countries which were subject to ITAR export proscriptions or restrictions still numbered 36, including

focus of attention/concern has thus moved from the traditional 'east bloc' countries to - roughly - the "terrorist countries", the countries subject to U.N. embargo, countries presenting human rights concerns, countries selling arms to areas of conflict, and to countries aiming at regional dominance. (The country pairs Iraq/ Iran and India/ Pakistan would, *inter alia*, belong to the latter category, but these countries individually are also listed under other categories).[211]

Suspension or modification

In the interest of the security and the foreign policy of the U.S., the Director of the Office of Defense Trade Controls "may order the temporary suspension or modification of any or all of the [above] regulations ..." And exceptions to the above provisions can be made by the above State Department official "[i]n a case of exceptional or undue hardship, *or when it is otherwise in the interest of the United States Government* ..."[212] (emph. add.)

The latter clause gives the Department and the President considerable discretion to deviate from the letter and intent of the ITAR and take export license decisions (partly) on other than national security grounds. As we will see later (in the respective chapters on the U.S.' launch trade relations with Russia and China) this frequently happened.

Congressional notification process

The Arms Export Control Act requires the President (who has delegated this task to the Secretary of State) to notify the Congress of certain export license applications at least 30 days prior to their approval. This provides Congress with an opportunity to review these specific transactions, and to enact a joint resolution or pass a law to prohibit the issuance of a license. If no such action has been taken by Congress, the Director of ODTC may issue the license on the 31st day. The Act delineates which cases require Congressional notification:

- all exports of defense articles or services with a value of USD 50 million or more; and
- all exports of Major Defense Equipment (MDE) with a value of USD 14 million or more.

The Act defines MDE as Significant Military Equipment (SME, *i.e.* articles for which special export controls are warranted because of their capacity for

Russia and a number of former Soviet republics, China, Mongolia, Iraq and the other above 'terrorist' states, Nigeria, South Africa and Zaire etc., see 5 (3) Defense Trade News (1994) at 12.

211. See ITAR 1996, *supra* note 196, Sec. 126.1 and 7 (1) Defense Trade News (1996) at 6-8.
212. *Ibid*, Sec. 126.2 and 3 respectively.

substantial military utility or capability) "having a one time research and development cost to the U.S. Government of $50 million or more, or a total U.S. Government procurement cost of $200 million or more."[213]
To the category of Significant Military Equipment belong all launch vehicle and missile systems, aircraft with missile launching equipment and all spacecraft and spacecraft equipment, except non-military communications satellites.[214]
As will be discussed later, in Chapter 3.1., this provision of the Act was applied in 1988 to the license application for the export of two U.S.-built telecommunications satellites to China, for launch on the Long March launch vehicle, which led to Congressional hearings on the matter.

Debarment
Violation of the (conditions of the) AECA may result in a fine and/or imprisonment and also in an exporter's "debarment", *i.e.* a prohibition from participating directly or indirectly in the export of defense articles, including technical data or in the furnishing of defense services for which a license or approval is required; the debarment is generally for a period of 3 years, and such a decision will be published in the Federal Register.[215]

213. See Sec. 36(c) and 47(6) AECA *jo.* Sec. 123.15 ITAR 1996; similar definitions of SME and MDE have also been included in ITAR 1996, in Sec. 120.7 and 120.8 respectively. "Special export controls" for SME include the need for Congressional approval, and, a.o., a special provision in agreements relating to the transfer of such SME which obliges the foreign consignee and end-user, and, if these are private parties, the foreign government to certify that the SME defense article will not be reexported to a third country without prior approval of State, see Sec.123.10 ITAR 1989. Even a proposal or presentation to a foreign person for the purpose of selling SME has to be notified to and approved by ODTC in advance, see *id.*, at Sec. 126.8).
214. See *id.*, at Sec. 121.1. All applications for so-called Technical Assistance Agreements (TAA) and Manufacturing License Agreements (MLA) involving the the manufacture of SME or MDE of a certain minimum value for or in a foreign country also have to be certified to Congress for review purposes, see Sec. 36(d) AECA and Sec. 124.11, ITAR 1996. An MLA is an "agreement (*e.g.*, contract) whereby a U.S. person grants a foreign person an authorization or a license to manufacture defense articles abroad and which involves or contemplates (a) the export of technical data ... of defense articles or the performance of defense services, or (b) the use by the foreign person of technical data or defense articles previously exported by the U.S. person." TAA is an "agreement (*e.g.*, contract) for the performance of defense services or the disclosure of technical data, as opposed to an agreement granting a right or license to manufacture defense articles.", Sec. 120.21 and 120.22 resp., ITAR 1996 *supra* note 196.
215. See Sec. 127.3 and 127.7, ITAR 1996; lists of debarred persons are also published in Defense Trade News, *passim*).

Communications satellites

The fact that all satellites were included in the USML, with the State Department controlling their export from the United States, put a national security and foreign policy 'brake' on the sale (and re-sale)[216] of U.S. satellites to foreign satellite operators, not only if launched by a U.S. firm from U.S. territory but also, and of particular relevance to our subject, if to be exported for launch by a foreign launch firm from the territory of a foreign country. The interdepartmental question and the concern of the industry in the course of the years was not so much whether the export of a non-military communications satellite should be subject to certain governmental controls, but whether these controls should remain in the hands of the State Department or rather be a matter for the Commerce Department.[217]

With the latter in the 'driver's seat', the industry increasingly felt that, though national security and foreign policy considerations would always continue to play a role in export licensing decisions, there would be a stronger pro-industry bias, at least mitigating (and possibly even neutralizing) the restraints and uncertainties caused by the State Department's foreign policy 'imprint'. The export controls of the Commerce Department do not apply to "arms" or "munitions" but to "*dual-use*" items, to some extent already a psychological difference both for the regulator and the regulated.

Finally, another provision of concern to U.S. exporters of space defense articles and services in the ITAR is entitled "Denial, revocation, suspension, or amendment of licenses and other approvals." It provides, in part, that "[a]ny application for an export license or other approval ... may be disapproved, and any license or other approval or exemption *may be revoked, suspended, or amended without prior notice whenever: (1) The Department of State deems such action to be in furtherance of world peace, the national security or the foreign policy of the United States, or is otherwise advisable;* ..."[218]

From the point of view of arms control, this clause may be justified and even reasonable. It is however hardly reconcilable with the U.S. exporters' understandable need for transparency and - particularly - predictability of the

216. Once in space, a satellite is still covered by the ITAR; the transfer of ownership, control or use of a satellite in orbit from one country to another requires a license, see 5 (1) Defense Trade News (1994) at 10.

217. In fact, as early as the late 1970s, the U.S. aerospace industry expressed its dissatisfaction with the situation that these satellites and the related technology, both available in Western Europe and Japan, were controlled by the State Department. At a Congressional hearing it was argued that a transfer to the controls of Commerce "would help American aerospace industry in the commercial exploitation of space technology in international markets.", see Valnora Leister, *Space technology: From national development to international cooperation*, unpubl. D.C.L. thesis, McGill University (Institute of Air and Space Law) (1982), hereinafter referred to as Leister, at 134.

218. See Sec. 126.7, ITAR 1989 *supra* note 196.

export licensing process, both in their relations with their international clients and vis-à-vis their international competitors.

2.3.1.2 The Export Administration Regulations and the Commerce Control List

In December 1774, the First Continental Congress declared the importation of British goods to be illegal. Twelve months later the Congress outlawed the export of goods to Great Britain, thus establishing the first American export controls. Since then, the U.S. has imposed export controls for a variety of reasons through legislation such as the Trading with the Enemy Act and the Export Control Act. The latter act of 1949 gave the Department of Commerce primary responsibility for administering and enforcing export controls on dual-use items. The term 'dual-use' is used by Commerce to distinguish products and technologies (that are controlled by that Department) that can be used both in sensitive (*e.g.* military or nuclear) and non-sensitive applications from products that are (a) weapons or military-related in use or design and subject to the controls of the Department of State or (b) subject to the nuclear-related controls of the Department of Energy or the Nuclear Regulatory Commission. In other words, dual-use items are commercial items which could have military applications. The Export Control Act for the first time formulated three reasons for the imposition of such export controls: national security, foreign policy and short supply. Its successor was the Export Administration Act (EAA or Export Act) of 1979 which was amended several times and lapsed on August 20, 1994. While its provisions and controls were thereafter maintained through an Executive Order, the EAA has been in the process of being rewritten and resubmitted to Congress ever since. The EAA and its implementing regulations, the Export Administrative Regulations (EAR or Commerce Regulations),[219] contain controls on exports from the U.S., and re-exports of U.S.-origin items from foreign destinations, on strategic commodities and technical data worldwide to prevent the diversion of such strategic items to *end-users* or *end-uses of concern*. The primary licensing agency within Commerce is the *Bureau of Export Administration* (BXA).

License requirements are dependent upon an item's technical characteristics, the destination, the end-use and the end-user, and other activities of the end-user. In other words, to quote a fact sheet of BXA, entitled "How do I know if I need to get a license from the Department of Commerce?" the following five facts have to be established to determine an exporter's obligations under the EAR: "What is the item you intend to export or re-export; where is it

219. EAA, 50 U.S.C. app. 2401 *et seq*; EAR, 15 C.F.R. Subchapter C.

going; who will receive it; what will they do with it; and, what other activities are they involved in?"[220]

A Country Chart in the EAR identifies those countries to which specific items cannot be exported without a license. As in the ITAR, specific countries or groups of countries may be subject to specific control criteria and conditions.

Thus, exports of strategically significant commodities and technology not designated as defense articles or services on the Munitions List are subject to the export controls of the EAA and the (implementing) Commerce Regulations. Because modern weapons depend on many advanced supporting technologies that have both civilian and military ('dual-use') applications, some commercial technology transfers raise U.S. national security concerns. Consequently, under the above Act, the Commerce Department is charged with issuing a license before any such dual-use technology or equipment can be exported from the United States to a potential adversary, and it must ensure that transfers of dual-use technology do not occur under the guise of civilian projects.[221]

The EAA of 1979 as amended sets out in its paragraph 2401 the following Congressional findings guiding - as far as the above security aspect of exports is concerned - the interpretation and application of the export controls laid down in the Act and in the Commerce Regulations based thereon:

"(5) Exports of goods or technology without regard to whether they make a significant contribution to the military potential of individual countries or combinations of countries may adversely affect the security of the United States.

(8) It is important that the administration of export controls imposed for national security purposes give special emphasis to the need to control exports of technology (and goods which contribute significantly to the transfer of such technology) which could make a significant contribution to the military potential of any country or combination of countries which would be detrimental to the national security of the United States.

(11) The acquisition of national security sensitive goods and technology by the Soviet Union and other countries the actions and policies of which run counter to the national security interests of the United States, has led to the significant enhancement of Soviet-bloc military-industrial capabilities. This enhancement poses a threat to to the security of the United States, its allies and other friendly nations, and places additional demands on the defense budget of the United States.

220. See Fact sheet - *Do I need an export license?* the US Dept of Commerce, Bureau of Export Administration <http://www.bxa.doc.gov/factsheets/facts 1.htm> (Apr 29, 1998).
221. See *US exports: strategic technology controls,* U.S. Department of State Dispatch (Jul. 29, 1991) at 551.

(12) Availability to controlled countries of goods and technology from foreign sources is a fundamental concern of the United States and should be eliminated through negotiations and other appropriate means whenever possible".

The EAR specify in great detail the licensing procedures, the "controlled commodities" as laid down in the so-called Commerce Control List (CCL), the countries (most) affected, divided into groups, and other administrative provisions. The "general policy" part of the EAR mentions the following purposes for these controls:

"(1) To protect the domestic economy from the excessive drain of scarce materials and to reduce the serious inflationary impact of foreign demand;

(2) To further significantly the *foreign policy* of the United States and to fulfill its international responsibilities;

(3) To exercise the necessary vigilance over exports from the standpoint of their significance to the national *security* of the United States".[222] (emph. add.)

Groups of countries

For export control purposes the Commerce Regulations provide for categories of countries or "Country Groups", to which each foreign country is assigned depending on the level or strictness of the controls the U.S. Government wishes to apply to the respective country. There are seven of these country groups designated by the symbols Q, S, T, V, W, Y, and Z, with, for instance, the "geographic area formerly known as the [USSR]", together with *inter alia* Laos and Albania in a country group to which strict controls apply (group Y).

China has been a special case, receiving increasingly better treatment (than the Soviet Union) through the years. In the 1960's it was classified under country group Z which prohibited all U.S. shipments to that country. As a result of President Nixon's 'normalization' overtures and the ensuing improvement of relations between the two countries, China, in 1972, was reclassified to group Y. In 1980, Carter saw reasons to further broaden export possibilities to China, and so did his successor Reagan one year later, establishing the so-called 'two-times' policy which allowed China to receive exports with twice the technical sophistication as exports to the Soviet Union.[223] It was also Reagan who, in 1983, placed China finally in the most liberal Country Group V, which it shares with most western countries until today, with the concomitant - more relaxed - controls (until the Tiananmen Square incident took place).

222. See para. 770.1, EAR *supra* note 219.
223. See Wirin, *supra* note 207.

To determine whether a particular commodity qualifies for export to a particular country of destination the exporter has to check the so-called Commerce Control List, which lists all commodities subject to the Department's export controls, and therefore also known as the "Commodity Control List" (CCL).
Roughly, a distinction can be made between commodities which do not raise foreign policy or security concerns no matter which country they are exported to, and which therefore qualify for a "general license", and all other commodities which, depending on the general category to which they belong (*e.g.* "telecommunications and cryptography" or "propulsion systems and transportation equipment"), the group of products (*e.g.* "software" or "technology"), particular type of control (*e.g.* "missile technology controls" or "nuclear non-proliferation controls") and the country group the commodity is destined for, require an individual so-called "validated license". Validated licenses require a formal application by the exporter of the commodity and a formal approval on the part of the Department of Commerce before the commodities can be exported.

Revocation
Sec. 770.3 (b) of the Regulations, entitled "Revocation of export licenses and other authorizations", contains a provision of similar concern to U.S. exporters of space related commodities on the CCL as the ITAR revocation provision does to probably the same exporters insofar as their space defense artcles and services fall under the USML:

"All export licenses and other authorizations to export or reexport are subject to revision, suspension, or revocation, in whole or in part, without notice. It may be necessary for the Office of Export Licensing to stop a shipment or an export transaction at any stage of its progress; *e.g.*, in order to prevent an unauthorized export or reexport ..."

Communications satellites
In November 1990, President Bush, by Executive Order, stated:

"I ... find that proliferation of chemical and biological weapons constitute an unusual and extraordinary threat to the national security and foreign policy of the United States and hereby declare a national emergency to deal with that threat."[224]

The E.O. ordered the State Department to lead multilateral efforts to conclude a global convention prohibiting the production and stockpiling of chemical weapons, ordered the Departments of State and Commerce to make a list of

224. Executive Order (E.O.) 12735 (Nov 16, 1990), reprinted by ACDA, <http://www.acda.gov/factshee/wmd/bw/execordr.htm> (May 11, 1998).

all goods, technologies and services that would assist a country in acquiring the capability to develop, produce, stockpile, *deliver*, or use chemical or biological weapons and whose export should therefore be forbidden, and ordered that sanctions be imposed on foreign persons and countries, including a prohibition on the sale of arms and dual-use goods and technologies, in case of their (contribution to the) development, production or use of chemical or biological weapons. (The sanctions against such foreign countries included the termination of landing rights of air carriers "controlled in fact" by the respective foreign government).[225]

At the same time, the president directed various other export control measures including the removal from the USML of all items contained in the Cocom dual-use list (the International Industrial List) (see hereafter) unless significant U.S. national security interests would be jeopardized. This order was meant to make the USML and the CCL more consistent with the above Cocom list, and to transfer those items to the CCL which, because of their dual-use character, should be controlled by Commerce rather than by State. A State Department official remarked, in March 1992, about this 'harmonization exercise' in testimony before the Subcommittee on space of the House Committee on science, space and technology: "our goal is to move all space items which are primarily commercial in nature off the [USML] onto Commerce's dual use list."[226]

To implement this part of the presidential directive, a technical working group was established, consisting of representatives from State, Commerce and Defense, and a number of other U.S. agencies. The analyses and proposals of the working group had a special political dimension in the period 1991-1992 because of the break-up of the Soviet Union and the resulting interest on the U.S. side in a redefinition of the rules and practices regarding space cooperation and trade in space goods and services (including the launch by Russia of U.S.-built satellites, which will be discussed later) between the U.S. and the Commonwealth of Independent States (CIS).

The result of the working group's recommendation was a final rule published in October 1992 by the State Department's Bureau of Politico-Military Affairs, which removed *certain* commercial communications satellites from the Munitions List to the Commerce Control List, contingent upon publication of a Commerce rule establishing national security controls on such satellites. Commerce published that rule on the same date in October 1992, adding these

225. See *id*, Sec. 5.

226. See Statement by Charles A. Duelfer, Director, Center for Defense Trade, Bureau of Politico-Military Affairs, US Dept of State, March 25, 1992, hereinafter referred to as Duelfer statement, in *Bilateral space cooperation with the former Soviet Union*, Hearing before the Subcommittee on space, House Committee on science, space, and technology, 102d Cong., 2d Sess. 59-75 (March 25, 1992) at 66; the expression "harmonization exercise" was used by a Commerce official at the same hearing, see *id*, at 78.

satellites to the CCL.[227] On December 28, 1992 the above State Bureau published another rule that proposed to remove all generic components, parts, accessoires, attachments and equipment associated with commercial communication satellites and passive remote sensing satellite ground stations from the USML to the CCL. Components that were specifically designed for satellites which remained on the USML would also remain under State Department control.

In other words, as a first step towards harmonizing and simplifying the two control regimes, a distinction was put into effect between military satellites and "certain non-military communications satellites which have capabilities that justify keeping them on the USML in the interest of U.S. national security", to be kept on the USML, and all other complete commercial communications satellites, including components and associated equipment, data and services, to be transferred to the CCL.[228] (In view of the partisan nature of U.S. politics it is relevant to note that the Clinton administration, having performed its own inter-agency study on the matter, approved the respective ITAR admendments, developed and proposed under president Bush, without change). The impression remains that only less sophisticated satellites were transferred to the export controls of Commerce. This predictably resulted in increased pressure from the industry for further de-controls to enable them to compete with their more sophisticated products on the world market (including the former Soviet Union), without direct (or indirect) State Department interference. The above State Department official remarked in conclusion:

"I would like to tell you that this [i.e. the transfer of certain commercial satellites to the Commerce list] will solve the question of the export of commercial satellites to the CIS. However, these same issues will be relevant when these commercial satellites are on the Commerce list. Therefore, we have placed a high priority on a review of this issue within the Administration."[229]

The U.S. aerospace industry's insistent call for change was supported by a number of compelling arguments. They compared the Administrations's

227. See *Commercial communication satellites; Revisions to the Commerce Control List*, 15 CFR Part 799, Dept of Commerce, Bureau of Export Administration, 58 FR 47322 (Sep 8, 1993) Background.
228. The amended USML, in its Category XV (Spacecraft systems and associated equipment), mentioned *inter alia* the following such satellite capabilities justifying continued State Department export controls: "... communications satellites ... (3) designed, modified or configured for intersatellite data relay links that do not involve a ground relay terminal ('cross-links') ... (5) employing any of the cryptographic items controlled [elsewhere in the USML] ... (9) having orbit transfer engines ('kick-motors') which remain permanently with the spacecraft and are capable of being restarted after achievement of mission orbit and providing acceleration greater than 1g." See Amendments to the ... (ITAR), 22 CFR Part 121, Dept of State, Bureau of Political-Military Affairs 58 FR 47636 (Sep 10, 1993).
229. See Duelfer statement *supra* note 226, at 75.

treatment of communication satellites with the way it dealt with other communications trade, such as fibre optics and telephone switching equipment which were controlled by the Commerce Department. They pointed out that characteristics once unique to military satellites were now routinely employed on commercial communications satellites. And they argued that the 30-year U.S. lead in selling commercial communications satellites was under challenge from Japan, Europe and Canada, each promoting the view that American manufacturers were unreliable because of the U.S. Government's restrictive export policies.[230]

The issue of export control reform in high technology would become the subject of Congressional scrutiny in 1993 with high profile statements of concern on the part of the U.S. industry, further increasing the pressure on the Administration.

In the mean time, the above Presidential concern, fueled by the sophistication of Iraqi missile capabilities due to rather careless U.S. and European exports of sensitive technologies to Iraq prior to the 1991 Gulf War, had led to new and stricter regulations promulgated by Commerce under the so-called *Enhanced Proliferation Control Initiative* (EPCI).[231]

These EPCI regulations were specifically aimed at stemming the spread of weapons of mass destruction, i.e. nuclear, chemical and biological weapons, and of the missiles used to deliver those weapons. For that purpose the EPCI regulations created the concept of projects and entities of concern. The most stringent forms of licensing, individual validated licenses, are required when an exporter "knows" or is informed by the Commerce Department's Bureau of Export Administration (BXA), that an item is either destined for such a project or for use by a country where a project of special concern is listed, regardless if it is destined for that specific project. This "knowing" standard imposed a much heavier burden on exporters than had been previously imposed in American export licensing.[232] To identify for U.S. businesses some of the organizations and companies that may be involved in prohibited weapons proliferation activities (so they know that exports even of normally uncontrolled goods and technology to these entities would create an unacceptable risk of use in or diversion to such activities) the EAR contains a list of so-called "entities of concern". This list puts exporters on notice that any products sold to these end-users may present concerns to the government and will require a license from BXA. This "Entity list" is revised and updated

230. See John D. Holum, Acting under secretary of state for arms control and international security affairs and Director ACDA, testimony before the House International Relation Committee and National Security Committee (Jun 18, 1998) <http:/www.acda.gov/speeches/holum/holtest.htm>, hereinafter referrred to as Holum testimony 1998.

231. See 56 FR 40,494-40,502 (1991).

232. Jack H. McCall, Jr, *The Missile Technology Control Regime and space launch vehicles: an update*, 20(2) J. Space L. 61-65 (1992) hereinafter referred to as McCall at 64.

on a periodic basis, by adding new or amended notifications and deleting notifications no longer in effect. The U.S. intelligence community undoubtedly plays a vital role in collecting the information necessary for that purpose. But the exporters also have a duty to determine the nature and activities of their potential customers and to report on anything that suggests that the customer concerned may be involved in proliferation-related activities. And penalties for violation of the Regulations may be stiff.[233]

To stay on the safe side, U.S. firms should also check BXA's "List of denied persons", which provides the names of all American and foreign persons (including companies, institutions and organizations) which, because of violations of the Commerce Regulations, are not allowed to participate in any transaction involving commodities subject to these Regulations and with whom U.S. firms are not allowed to do such business.[234]

Exporters frequently complained about the extent of the 'knowledge' they were required to have about the end-user and the end-use to avoid possible sanctions from the controlling agency. In fact, in 1997, the government admitted that "[w]e continue to grapple with revising the 'catch-all' controls that form part of the 1991 Enhanced Proliferation Control Initiative (EPCI). Exporters view the catch-all as too broad in scope and the knowledge standard as unclear."[235]

One of the phenomena the U.S. administration also has been grappling with for many years is the question of how to effectively deal with 'pariah states',

233. See The Entity List, Entities of proliferation concern listed in Supplement No. 4 to part 744 of the [EAR], updated Oct 1, 1997 <http://www.bxa.doc.gov/entities.htm> This supplement lists a number of Indian and Pakistani research centers and laboratories, but also a Russian research institute, Chinese laboratories and Ben Gurion University, Israel, "for computers between 2,000 and 7,000 Mtops." According to a senior official of the Commerce Department in early 1997, BXA's enforcement programs, focusing on specific end-users and end-uses, led to hundreds of investigations over the last four years that have led to the criminal prosecution of persons who illegally exported zirconium for Iraqi munitions, unlicensed equipment for India's missile program, brokerage services for Iraqi rocket fuel, and gas masks to suspected Aum Shinrikyo terrorists in Japan, see Update West 1997, speech William A. Reinsch (Undersecretary for export administration, Dept of Commerce (Feb 10, 1997), hereinafter referred to as Update west 1997, at 2 <http://www.bxa.doc.gov/supdate.htm>.

234. See U.S. Dept of Commerce, [BXA], Denied persons list currently in effect (Revised May 6, 1998) <http://www.bxa.doc.gov/2_denial.htm>.

235. See Update west 1997, *supra* note 233, at 4. The same government spokesman concluded: "Since the definition of 'knowledge' includes 'awareness of a high probability' that a proliferation-related use is involved, you need to screen, to pursue and resolve red flags, and to come to us for guidance or a license if you cannot satisfactorily resolve red flags", *ibid.* 'Red flags' are defined as "any abnormal circumstances that indicate that the export may be destined for an inappropriate end-use, end-user, or destination ... Commerce has developed lists of such 'red flags' which are not all-inclusive but are intended to illustrate the types of circumstances that should cause reasonable suspicion that a transaction will violate the EAR", see U.S. Dept of Commerce, [BXA], *Know your customer guidance* <http://www.bxa.doc.gov/Enforcement/knowcust.htm>.

and the attitude of Congress in this connection. In early 1997, a Commerce official put the dilemma as follows:

"Most of the time scholars have concluded sanctions have little effect, and they frequently hurt the imposer more than the recipient as other countries' exporters rush to fill the trade gap. Sanctions work best when they are broadly multilateral, when the target country is small and relatively defenseless, and, I would argue, when sanction-breaking activity is most likely to lead to media criticism and international embarrassment. Sanctions work least well when they are unilateral and are driven by home country politics rather than as part of a well thought-through multilateral strategy.
What is new is the increasingly assertive role of Congress in what I call the country-of-the-month-syndrome. Amendments have been offered for years, but until recently the moderate center used to prevail, and they were defeated."[236]

The role of Congress will be further illustrated in Chapter 3.1 discussing the U.S.-China launch relations and in Chapter 4. The observation that multilateral sanctions are more effective than unilateral ones reflects a longstanding policy of the U.S. to seek multilateral arrangements on export controls in view of the futility of unilaterally restricting the exports of specific commodities or technologies when these are readily available for export in other countries and the latter not only feel no obligation, legal, moral or other, to follow the U.S. example, but rather see a U.S. export restriction as a unique opportunity for their own exporting industries to make a sale unhindered by their American competitors. Hence U.S. inspired Cocom, hence Wassenaar, hence MTCR.

2.3.2 The role of CoCom and its successor, the Wassenaar Arrangement

The Coordinating Committee for Multilateral Export Controls was established in 1949 following the separation, by the 'iron curtain', of Europe in a western and a Soviet-dominated eastern part. The western countries, including the U.S., felt the need to join forces and agree on the type of goods/equipment and technology that, because of their strategic importance, should not fall into the hands of the Soviets and their allies. A Senate hearing in 1983 elicited the following rationale for stronger controls, as proposed by the Reagan administration, on the transfer of technology from the West to the East:

"Current controls are based on the importance of advanced technology in military forces and its supporting industrial sectors and the existence ... of a technology gap between the [U.S.] and the Soviet Union. A technological gap in our favor is also a means of reducing the risk of technological surprise. ... a particular technological development could give the discoverer a decisive advantage. Consequently, one of the major means of preventing war is to avoid technological surprise ... an increasing one-way stream of U.S. technology is

236. See Update west 1997, *supra* note 233, at 5.

moving to the Soviet Union. Nearly all technological developments have direct or indirect military application."[237]

CoCom was created as a non-treaty organization, a forum, that (a) cooperatively restricted exports to certain, primarily communist, countries and (b) collectively determined the goods and technologies to be restricted and the controlled countries.
Its membership included the members of NATO, with the exception of Iceland, plus Australia and Japan.[238]
To perform its control functions, CoCom established and updated lists of embargoed products and technologies which provided the basis for the national control lists administered by each of the member governments.[239]

There were three such lists which were reviewed about every three years to take account of technology developments and other control-relevant factors:
- a list of military items and technologies,
- an atomic energy list, and
- a list covering commodities and technologies which can have both military and civil applications (dual-use), later better known as the "(International) Industrial List" ((I)IL).

A second traditional CoCom task was to act as the clearing house for individual requests submitted by the member governments to permit the shipment of specific embargoed items to the proscribed countries when the risk of diversion to military use was considered sufficiently small. (Proscribed destination for CoCom purposes in 1983 were the Soviet Union, the other Warsaw Pact countries, Albania, the People's Republic of China and some other (communist) countries in Asia, such as Vietnam).

237. See W. Schneider (Under Secretary for Security Assistance, Science and Technology), *Export control of high technology* (Mar 2, 1983), Dept of State Bull. 71-74 (Jun 1983) at 71.

238. The Commerce Regulations, as published in 1994, the year of CoCom's demise, listed the following 17 CoCom members: Australia, Belgium, Canada, Denmark, France, Germany, Greece, Italy, Japan, Luxembourg, the Netherlands, Norway, Portugal, Spain, Turkey, United Kingdom and the U.S. Apart from these, there were a number of so-called "cooperating countries", *i.e.* countries which cooperate fully with the CoCom members in restricting strategic exports to controlled countries in accordance with CoCom standards: Austria, Finland, Hong Kong, Ireland, New Zealand, Sweden and Switzerland, see Sec. 770.2, Commerce Regulations, Bureau of Export Administration, Dept. Of Commerce, 15CFR Ch. VII (1-1-94 Edition).

239. In the U.S., primarily the Export Administration Act of 1979 and also the Arms Export Control Act of 1976, see previous para. The U.K. implements its CoCom control obligations through the Export of Goods (Control) Order and Germany has its Aussenwirtschaftsgesetz, see Dennis J. Burnett and Marco Fuchs, *Amendment of CoCom rules and the commercialization of space*, Proceed. 33rd Colloq. L. Outer Space 11-17 (1990) hereinafter referred to as Burnett and Fuchs, at note 3. The Netherlands national equivalent is the "Uitvoerbesluit Strategische Goederen" of 1963.

A third major function of CoCom was to serve as a means of coordinating the administration and enforcement activities of the member governments.

In practice this meant that, after national export control authorities such as Commerce's BXA or State Department's ODTC, had decided to grant a license for the export to the Soviet Union of a controlled good or technology appearing on any of the above lists, this export permission would only become effective after CoCom had reviewed and unanimously approved it. For example, in 1989 a total of 1557 of such national requests for an exception to the Cocom export restrictions were submitted to the members. Generally, some 90% of these requests would receive approval.[240]
Obviously, this multilateral system could only work if all CoCom parties' national export regulations encompassed the same items as laid down in the above lists, and if a 'no license' decision of CoCom vis-à-vis one of its exporting members would be scrupulously adhered to by all other members; and, even more important, if all members shared the same non-proliferation worries, to the same extent and with respect to the same countries ... The latter requirement was probably only met during the first decade of the cold war when the concept of a *common* (communist) enemy was very much alive in the western world. But, where only one member insists on strict common controls towards its own (pet) adversary and other members perceive a lesser threat emanating from the country in question, adherance to the letter and spirit of the CoCom arrangement is much harder to achieve.

Most items on the U.S. Munitions List and the Commerce Control List were also included in the CoCom lists, and the CoCom lists found their way into the national export regulations of the member states, resulting in unilateral US export controls thus having the coveted multilateral 'blessing' (and support). Basically all space-related products and technologies, such as communications satellites, launch vehicles and technology, and computers fell under the controls of all CoCom members, and the sale of these 'strategic' goods to countries like the Soviet Union, China, the East-European countries, Vietnam and North Korea remained restricted until the overall political landscape and/or specific bilateral relations called for change.

Although the members of CoCom had no legal obligation to abide by commitments made, at least over the first three decades of its existence there had been only a few instances when a member nation exercised its sovereign right to deviate from CoCom decisions. Decisions were made on the basis of

240. See Letter Netherlands Deputy Minister Economic Affairs of Feb 26, 1990 to (Parliamentary) Permanent Foreign Trade Committee, on Cocom Executive Committee meeting, Paris, Feb 14-15, 1990, Staatscourant 1990-41 (Feb 27, 1990). Some goods on the IL do not have to be submitted to the Cocom partners; the export can be approved by the country concerned ("administrative exception"), *ibid.*

unanimity (which some saw as the basic reason for CoCom's durability). No change in the CoCom lists could be made, and no specific export of a controlled item could be approved if any of the members objected.

During both the 1960s and the 1970s the combination of national and international export control systems was in principle applied, but technology transfer issues, both in the U.S. and within CoCom, received relatively little attention in practice. The situation changed with the 1979 Soviet invasion of Afghanistan coupled with the growing realization that acquisition of advanced western technology was enhancing the military capabilities of the Soviet Union.[241]
As a consequence, export control in general and the prevention of the acquisition of advanced technology by the Warsaw Pact in particular became an early and very high priority of the 1981 Reagan administration.

In that connection, a review of CoCom's effectiveness was made. It revealed that, though in general the national controls coordinated through CoCom had been useful for restricting exports of items reviewed by the CoCom governments, and competition between western exporters in selling technology to the Warsaw Pact countries had been prevented, violations of CoCom controls had taken place, items had not been multilaterally controlled at the time of the sale, and Soviet 'technology piracy' had increased, resulting in militarily sensitive technology ending up in the hands of the Soviet bloc countries. Hence, a series of efforts was made on the part of the Reagan administration to considerably strengthen the effectiveness of the national enforcement activities and harmonize licensing procedures. A particular worry at the time was the the difficulty of controlling the export or re-export of commodities from non-CoCom countries to the Communist states, a problem which the U.S. addressed by requiring national licenses for *re*-exports of the U.S.-origin embargoed products from third countries, but a solution which few CoCom partners were willing to copy.
This renewed attention, on a high policy level, to the effectiveness of the national controls and corresponding vigorous efforts to 'bringing CoCom out of the doldrums' led not only to large increases in staff dealing with export controls within the Departments of Commerce, Defense and State, but also to

241. An example of the latter was the sale of $1.5 billion worth of U.S. and other western technology that allowed the Soviets to build the Kama River Truck Plant in the early 1970s. The factory produced large numbers of military trucks that were used in the Soviet invasion of Afghanistan and by Soviet military units in Eastern Europe opposite NATO forces. The sale was legal at the time and approved with the understanding that the technology would be put only to civilian use, see *U.S. export control policy*, address by the Senior representative for Strategic Technology Policy, Dept. of State (Wendt) before the Atlantic Council of the United States (Jun 14, 1988), American Foreign Policy (Dept. of State publ.), Doc. 47, 126-129 (Jun 1988), hereinafter referred to as Wendt address 1988, at 126.

a strengthening of CoCom's structure. As a consequence, in 1988, a State Department official could conclude:

"There is no question that the U.S. export control system is vastly superior to what it was in 1980. The CoCom system is far more effective ... We have certainly frustrated countless Soviet acquisition efforts across the world."[242]

Nevertheless, the sale by Japanese and Norwegian firms of machinery that provided a Soviet naval shipyard with the means to mass-produce quiet submarine propellers shocked the U.S. administration and its CoCom partners into a campaign to (further) revitalize CoCom. As a result, a high-level January 1988 meeting in Versailles agreed to rationalize the CoCom control list[243], strengthen cooperation with non-CoCom countries on technology transfer, harmonize and reinforce national controls and facilitate the flow of strategically significant goods and technologies among participating countries. The latter goal was of particular importance as it was meant to result in a license-free strategic trade zone among the CoCom countries with common export control standards with respect to the controlled goods and technologies vis-à-vis the outside world, *i.e.* primarily the Warsaw Pact countries. In June 1988, the State Department still took the view that nothing had happened that would justify a more liberal policy on exports of strategic goods and technology to these countries: "As we pursue greater contacts, greater scientific exchanges, and greater non-strategic trade with the Soviet bloc, we must, at the same time, protect the technology that underlies our security."[244]

Less than 2 years later, President Bush called upon the CoCom member states to adapt their export control regimes to the rapidly changing international political and military environment following *glasnost* and *perestroika* in the Soviet Union and the desintegration of the Warsaw Pact. A major year-long review of East-West export control policies within CoCom followed, and in May 1991 the parties agreed to implement a new system of export controls for dual use goods and technologies with significant military applications. Central to the new system was a thorough overhaul of the CoCom lists, not only because the strategic situation had changed but also in view of the rapid diffusion of some technologies, such as computer technology, that were making the existing control lists increasingly obsolete. A new "Core List" designed to cover only the most strategic, 'truly critical' dual-use goods and technologies, 50% shorter than the one it replaced *inter alia* because of a massive de-control of readily available off-the-shelf items, and the adoption of a 'common standard' of effective national control enforcement provisions

242. See *id.*, at 127.
243. *E.g.* by removing items from the list which, due to worldwide technological developments, have become less relevant for control purposes, such as many types of personal computers.
244. See Wendt address 1988, *supra* note 241, at 128.

were to constitute "a higher fence around fewer items". This new list, the International Industrial List (IIL), also provided wide-ranging favorable export licensing treatment for former Soviet bloc East European countries that were seen as representing a lesser strategic threat, namely Poland, Czechoslovakia and Hungary. These countries could henceforth be the recipient of all telecommunications equipment, except encryption devices, exported by individual CoCom countries without Cocom intervention. (As a necessary *quid pro quo*, the U.S required these countries to implement CoCom standard national control measures to ensure that the controlled goods and technologies they would be entitled to receive would not pass to unauthorized destinations and were used exclusively for civilian purposes.)[245] The Soviet Union, on the other hand, was only permitted to acquire telecommunications goods and technologies comparable to western standards of the early-to-middle-1980s. In fact, the selections made were very much dependent on the level of sophistication of Soviet capabilities the U.S. military and security establishment could feel comfortable with. Thus, the U.S. introduced a new measure of military criticality: the degree to which acquisition of a good or technology by the Soviets would result in the closing of a critical technological gap between Western and Soviet-based military systems.
(The example used in this connection was the night vision device which played a critical role in the coalition victory in Operation Desert Storm)[246]
An important criterion for de-control was "foreign availability", a test which was applied by the U.S. in the CoCom talks to anything from avionics to laser systems. In the words of the U.S. representative,

"[w]herever we found wide availability outside CoCom, we readily agreed to decontrol such commodities. Further, where we found Soviet capabilities equal to or better than previous control levels, we also sought decontrol. But, where dual-use goods or technologies are unique to CoCom suppliers, and are of gap-closing strategic significance, we pressed the allies to retain controls."[247]

It is important to note in this connection that, where in this multilateral forum the selected level of controls with respect to the Soviet Union was to a large extent determined by the U.S. Administration's perception of the military-strategic risks concerned, Congress targeted Soviet treatment of nations and religious groups within its sphere of influence and used the (possible relaxing

245. See Burnett and Fuchs, *supra* note 239, at 14.
246. See Statement by Press Secretary Fitzwater on multilateral export controls, May 24, 1991, 27 (21) Weekly Comp. Pres. Docs. (Administration of George Bush) (May 27, 1991); also on the above subject, *US export controls in a changing global environment*, Ambassador Allan Wendt, Senior representative for strategic technology policy (address before a National Academy of Sciences symposium, Jun 11, 1991), US Dept of State Dispatch 480-482 (Jul 1, 1991) hereinafter referred to as Wendt 1991, at 481.
247. See Wendt 1991, *supra* note 246, *ibid.*

of) export controls to exert pressure on that country to show a 'better behavior'. As one author noted:

"... the House of Representatives on June 6th [1990] voted 390 to 24 to block increased computer, telecommunications and hight technology sales to the U.S.S.R. The reason for this action was the Lithuanian issue [*i.e.* the Soviet's economic boycot against Lithuania] and to insure the continued emigration of Soviet Jews."[248]

Although the same author calls it "perplexing ... that space issues are held hostage to serve political goals", this was of course not a new phenomenon in U.S. political practice in general and in the interaction between the Administration and Congress in particular. The U.S. 'space relations' with China showed a similar pattern. (See Chapter 3.1)

Nevertheless, towards the end of 1991, Administration officials were already using a different approach when discussing the necessity of continued CoCom controls with respect to the Soviet Union. Not only did the new core list of dual use items constitute a "vast liberalization" of strategic trade restrictions as such, but the U.S. and its CoCom partners had also greatly liberalized in practice their treatment of requests for licenses of controlled items to the Soviet Union, because of the parties' commitment to supporting the Soviet Union's integration into the world economy and Soviet market reform. As a Commerce official assured the House of Representatives, "CoCom's remaining high technology restrictions will not impede the modernization and restructuring of the Soviet economy. CoCom restrictions are really very peripheral to the problems affecting Soviet economic progress ... [these] problems are caused by the lack of markets, not CoCom controls."[249]

In March 1992, the U.S. decided to establish diplomatic relations with Georgia (after having recognized Georgian independence in December 1991), and in the same month a White House announcement called for expanding and normalizing trade with the republics of what had been the Soviet Union, especially in areas of high technology. This involved both the decision to

248. See Wirin, *supra* note 207, at 6.

249. See *US export control policy adapts to a changing world*, Cristopher G. Hankin, Deputy Assistant Secretary for international trade controls, statement (Sep 24, 1991), US Dept of State Dispatch 752-754 (Oct 7, 1991) at 752. The statement also detailed the liberalization measures already taken by CoCom vis-à-vis the Soviet Union in such areas as the energy sector, the computer industry, transportation, manufacturing and telecommunications, and announced for the Baltic states an approach similar to the one used vis-a-vis Poland, Hungary and Czechoslovakia. Finally, controls on 'intra-CoCom trade' would be virtually eliminated by Jan 1, 1992 (concurrent with the expected time of implementation of the CoCom common standard) except for a short list of items contained in a common 'exclusion list'.

purchase sophisticated space-related goods from Russia and a commitment to further adapt CoCom controls to post-Soviet Union circumstances.[250]
The above developments culminated in a June 1992 decision by the CoCom member countries to establish a CoCom Cooperation Forum on Export Controls (CCF) and *to invite the republics of the former Soviet Union to participate*. The resulting historic meeting of November 1992 in Paris included representatives from all East European countries, the Baltic states and all but three of the former Soviet republics (and the CoCom member states of course) in attendance. For the first time the former adversaries jointly discussed both the liberalization of trade in sensitive goods and technologies between the countries participating in the forum and the establishment (with CoCom members' help) of harmonized national export control systems vis-à-vis non-participants. The final step towards a total revamping of CoCom's aims and, in fact, towards its dissolution was taken at the April 1993 Vancouver summit meeting of Presidents Clinton and Yeltsin. At that occasion, President Yeltsin expressed concern that CoCom, along with other cold war era restrictions, was harming reform and standing in the way of building a new strategic partnership with the West. In the joint statement with which the two presidents concluded their two-day meeting, they not only announced the establishment of a U.S.-Russian Commission on technological cooperation in the fields of energy and space (headed by Prime Minister Chernomyrdin and Vice President Gore), but also decided "to promote access to each other's markets ... removal of impediments to trade and investment ... [and] to work together to remove obstacles impeding Russia's access to the global market in high technology and related services."[251]
This outcome provided additional impetus to the CoCom countries' review of the arrangement's (possible) future purposes. The conclusion was clear:

"[t]he end of the Cold War, the disintegration of the Soviet Union, deep cuts in the arsenals of both sides, and the goal of assisting economic and political reform in Russia and the other New Independent States - rather than retarding their economic development - all led us and

250. See Statement by White House Press Secretary Fitzwater, Mar 24, 1992 (re Georgia) and Fact Sheet, White House, Off. of the Press Secretary, Mar 27, 1992, US Dept of State Dispatch 253 (Mar 30, 1992). The U.S. bought a Topaz space-nuclear reactor, Hall Thrusters (for efficient orbital transfers of satellites) and Plutonium-238, which would fuel generators supplying electricity on NASA deep-space missions (typically, the sale would be conditioned on a commitment by Russia not to use the proceeds to support its nuclear weapons production). Under its new export policy, the Administration would review license applications promptly, consider with a presumption of approval all export licenses for dual-use items to *civilian* end-users in the republics of the former Soviet Union, and deny such applications only if the export would jeopardize the security interests of the U.S. and its allies, see *ibid.*

251. See Joint statement at Vancouver by Clinton Yeltsin, White House Press Release, Apr 4, 1993, The White House Virtual Library <http://library.whitehouse.gov/cgi>.

our allies to the view that the CoCom arrangement had outlived its strategic rationale and could not be sustained."[252]

Rather than sweeping away the CoCom arrangement altogether, the parties found good reasons for an orderly transition to a new regime which could respond to new security threats. One argument supporting that approach was the fact that the Western cooperation within CoCom, *e.g.* in the elaboration of control lists, licensing standards etc., was worth preserving as a means for addressing these new threats.
A proposal, for a new, more broadly based mechanism with which the U.S approached its CoCom allies in mid-1993, outlined the following objectives:

"- To deal firmly and creatively with dangerous states - *e.g.*, Iraq, Iran, North Korea, and Libya - that are contributing to tensions in regions such as the Middle East;
- To further the process of engaging Russia and other New Independent States in establishing effective export control systems and combating the global proliferation of weapons and sensitive dual-use technology;
- To close gaps in the non-proliferation regimes and improve our ability to enhance regional stability by controlling conventional arms and sensitive dual-use sales on a multilateral basis for the first time; and
- To remove disadvantages placed on U.S. exporters by the lack of adequate multilateral coordination on sensitive transfers to terrorist states and on other threats."[253]

A high-level meeting of the 17 CoCom governments in The Hague later that same year endorsed the broad outlines of of the above proposal and agreed on a work program for phasing out CoCom and inaugurating a new arrangement, with a timetable to achieve both on March 31, 1994.
While indeed, at a meeting in The Hague on that specific date, CoCom's end was made official, the new regime would take much longer to become a reality. One can identify at least two reasons for this delay.
First, though Russia had expressed interest in participating in the new arrangement and being among the founding members, and the U.S. and its partners were eager to bring in Russia as an equal partner to make the regime effective, there were hesitations on Russia's *de facto* commitment to the (new) group's export control policies. A particular concern in this connection was Russia's continuing sales of arms to Iran, a country which had been categorized by the U.S. and a number of other former CoCom members as one of the "rogue" countries targeted by the new regime.[254]

252. See *Export controls and non-proliferation regimes in the post-cold war world*, Lynn E. Davis, Under Secretary for international security affairs, statement, House (Feb 24, 1994), 5 (11) US Dept of State Dispatch149-152 (Mar 14, 1994) hereinafter referred to as Davis statement, at 150.
253. See *ibid.*
254. See *ibid.*

The second reason: a White House statement one week after CoCom's 'sunset' identified the new post-cold war security threats which justified the creation of a successor to the deceased cold war regime as follows:

"... dangers to peace and stability in new regions of the world, particularly the Middle East and South Asia, and also threats posed by rogue countries such as Iran, Iraq, Libya, and North Korea. So the two major goals of the new regime will be to work together to deny trade in dangerous arms and sensitive technologies to those regions and to those states."[255]

The problem was to get an agreement, within an increasingly large group of potential arms suppliers and sellers of sensitive goods and technologies, on the specific regions and countries which should be denied such arms, goods and technologies under the new regime. For, it was one thing for the parties to come to a gentlemen's agreement on provisionally continuing national controls of these items (on the basis of the established CoCom lists), albeit on a global instead of East-West basis, but it was something completely different - and difficult to get agreement on - to jointly identify the regions and countries of special concern, to which, in a new regime, the national export restrictions of all participating countries should apply.
During CoCom times, the national lists of proscribed countries of the U.S. were both different and longer than those of some other CoCom members. Now, a new multilateral system based on a selection of countries, let alone on veto power as in CoCom, was increasingly difficult to accomplish.
At one stage, though the U.S. had also Sudan, Syria and Cuba on its national lists, the parties appeared to be close to an agreement on jointly denying conventional weapons to only four 'blacklisted' countries: Iran, Iraq, Libya and North Korea.
At the same time some countries refused to have specific weapons on the list, or were unhappy about the relevant procedures, which included a transparent *reporting system* on sales made. (For a long time the U.S. proposals contained a requirement of *pre-notification* of intended exports of a limited number of highly sensitive technologies and products, which a number of European countries and Japan saw and rejected as a potentially competition-distorting, if not foul play inviting 'tell your competitors what sales you try to make' obligation. In an arms sales market which had shrunk considerably since the end of the cold war, the international arms manufacturers' battle for market share had considerably intensified already.)

But the most fundamentally contentious issue, splitting the party into two groups, was the overall scope of the arrangement: one group insisted on a system covering both conventional weapons and dual-use goods, the other, (not

255. See *Reforming export controls*, opening statement by Under Secretary for international affairs Lynn E. Davis, State Dept press briefing, April 7, 1994, 5 (15) US Dept of State Dispatch 204 (Apr 11, 1994).

surprisingly including major arms-exporting countries, in particular France), preferred the new regime to be limited to dual-use goods and technologies only.[256]
As long as Russia did not join there was little sense in even continuing the multilateral discussions. At various occasions, both before and after CoCom's demise, bilateral discussions between the U.S. and Russia took place on the above issues, but, for a long time, without result. Russia's hesitations to both open the books and accept restrictions on weapons sales, the proceeds of which this cash-starved country desperately needed, blocked progress of the talks. The U.S. was however determined to have Russia, and eventually also China, a major arms exporter, on board, though not at all cost: as a State Department official responsible for export controls stated in early 1995:

"... in September 1994 President Yeltsin made a public commitment to end future arm sales to Iran and fulfill only existing contracts ... *Russia*, as a major supplier, must be factored into the CoCom successor regime and any credible arms restraint arrangement ... Resolving this issue [of Yeltsin's pledge to end arms sales to Iran] will pave the way for Russia's participation in the new regime.
According to mutual agreement, new members must adhere to international non-proliferation norms, be committed to responsible arms and sensitive dual-use transfer policies, and have effective export controls. By these standards, *China* is not yet eligible to join the successor regime." (emph. add.)[257]

Finally, in September 1995 Russia was prepared to join the regime and the U.S. was prepared to accept that country's participation on the basis of the latter's commitment to cease selling weapons to Iran and institute adequate export controls. In December of the same year 28 countries, the former CoCom members plus Russia, the 4 Visegrad (East European) states, Ireland, Finland, Austria, Sweden, Switzerland and New Zealand, appropriately convened in the Peace Palace in The Hague, the Netherlands, and agreed on the establishment of the new arrangement.
And on July 12-13, 1996 in Vienna, the *Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-use Goods and Technologies* was officially established, with an - overly ambitious - implementation target date of November 1, 1996. (On that date parties aimed to have the new lists of dual-use items and munitions in place and functioning).

The primary goals and tasks of the Wassenaar Arrangement, also known as the New Forum, were summed up by the State Department as follows:

256. See "Nieuw Cocom, met Rusland, gaat wapenexport controleren" ("New CoCom, including Russia, will control export of weapons"), interview with Frans Engering, Director General Foreign Economic Relations, Netherlands Ministry of Economic Affairs, NRC Handelsblad (Jan 5, 1996) at 11.
257. See 6 (1) Defense Trade News (Oct 1995) at 12, 13.

"... to focus on preventing destabilizing buildups by encouraging *transparency*, holding consultations, and adopting common policies: and to deal firmly with countries of concern (Iran, Iraq, North Korea, and Libya) by restricting transfers of arms and sensitive dual-use technologies.
Members will share intelligence on threats and global trends; provide information on transfers of arms and sensitive dual-use articles to countries of concern; and define common approaches, including restraint policies when appropriate." (emph. add.)[258]

Unlike CoCom the Arrangement is not directed against any state or group of states and therefore does not mention specific 'blacklisted' countries. It is not supposed to stand in the way of bona fide civil transactions, nor will it interfere with the rights of states to acquire legitimate means with which to defend themselves pursuant to article 51 of the U.N. Charter. All in all, 33 countries co-founded the Arrangement and committed themselves to contribute to regional and international security by, *inter alia*, "enhancing cooperation to prevent the acquisition of armaments and sensitive dual-use items for military end-uses, if the situation in a region or the behaviour of a state is, or becomes, a cause for serious concern to the Participating States."[259]

Sharply different from the CoCom regime is the absence in 'Wassenaar' of a veto power for each of the members. This had provided - in principle - an effective tool for the mulilateralization of controls in the case of exports covered by Cocom. Wassenaar has given more responsibility to each individual member to behave responsibly and to legislate and enforce effective national controls. The multilateral aspect is taken care of in two ways:
first, a new list of controlled weapons and strategic commodities had to be unanimously agreed upon by all Wassenaar members;
secondly, all national export licenses for weapons and dual-use commodities have to be reported to the Secretariat in Vienna, for distribution among the member states.
The combination of these two requirements provides all participants with insight into the sensitive exports of all Wassenaar adherents and enables all concerned to *ex post facto* review and challenge any member's sensitive sales and export practices; this system of 'transparency' is also supposed to assist the participants in "developing common understandings of the risks associated

258. See 7 (1) Defense Trade News (May 1996) at 20. Wassenaar is the name of the town, close to The Hague, where preparatory discussions on the issue took place.
259. See The Wassenaar Arrangement on export controls for conventional arms and dual-use goods and technologies, factsheet ACDA (Jul 1996) <http://www.acda.gov/factshee/conwpn/wassenaa.htm> The factsheet lists the following participants, with Bulgaria and Ukraine among the new-comers: Argentina, Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Poland, Portugal, the Republic of Korea, Romania, the Russian Federation, the Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States.

with the transfers of these items",[260] which may be translated to "now that you (we all) know how the listed arms or goods you sold to a foreign country/company were used, you (we all) will think twice before making the same mistake again." Similarly, the participating states have also undertaken commitments to notify each other preferably within 30 days, but no later than 60 days, of an approval of a license that has been denied by another participating state for an essentially identical transaction during the preceding three years. Transparency should thus lead to mutual control of export behaviour and, hopefully, to overall responsible behaviour in accordance with the spirit of the Wassenaar Arrangement.
To that end, the contents of the Wassenaar list and the agreed reporting procedures have to be translated into national export regulations. The U.S did so on January 15, 1998.[261]

One question is of course whether this arrangement will do the job it is supposed to do, *i.e.* to contribute to regional and international security. As indicated above this will depend on the extent to which each participant feels the need to strike a balance between its national economy-driven sales efforts on the one hand and the international security-induced restraints (no sales of certain goods/technologies to certain countries or regions) on the other hand. A U.S. Commerce official, in early 1998 gave the following tentative appraisal of the Arrangement's prospects:

"The Wassenaar Arrangement's lack of strong central authority and its lack of explicit target countries, in contrast with CoCom, is a reflection of the times - the absence of a single large threat and lack of agreement over the nature and seriousness of the smaller threats. That weakness has complicated its development and made consensus among the expanded membership more difficult to achieve. Nevertheless, its inclusion of conventional weaponry is a major step forward, and I am confident that as its procedures and reporting requirements become routinized, discipline will grow."[262]

Another, and in fact the main, question is to what extent Cocom introduced or reinforced controls which affected the trade in launch services and whether Wassenaar will have similar consequences.

260. See *Implementation of the Wassenaar Arrangement List of Dual-Use Items; Revisions to the Commerce Control List and Reporting under the Wassenaar Arrangement*, Supplementary information, 63 FR 2452 (Jan 15, 1998) (to be codified at 15 CFR pts. 732, 740, 742, 743, 744, 746, 762, and 774.
261. For the amendments of the U.S. Commerce Regulations and the CCL, see *id.*; the Netherlands amended its corresponding regulations, Uitvoerbesluit Strategische Goederen 1963, by Besluit van 19 november 1997, houdende de 22e wijziging van het Uitvoerbesluit Strategische Goederen 1963, Staatsblad 1997-560 (Nov. 27, 1997).
262. See Opening address Under Secretary William A. Reinsch, [BXA], Dept of Commerce, Update West 98, Los Angeles (Feb 10, 1998) <http://www.bxa.doc.gov/press/98/updbills.htm> hereinafter referred to as Reinsch Update West 98.

An attempt to more fully answer that question will be made after the review of the (effects of the) Missile Technology Regime in the next sub-chapter. As part answer the following is submitted. There is no doubt that CoCom, both in itself and as an extension of U.S. and other national export regulations, put brakes on the sale of high technology, including launch technology and satellites to communist countries. The veto power of the member states over national exports of these controlled items meant that these countries could not *buy* Western satellites or satellite components, either for own use or for resale to third countries and had therefore also no possibility to *launch* such satellites. If a European satellite manufacturer wanted to sell a satellite to the Soviet Union, it knew beforehand that the U.S. would probably veto such a deal. When in 1988, the U.S. administration was finally prepared to allow the Chinese to launch a U.S.-built satellite, it needed not only a Congressional consent but also CoCom members' unanimous approval of the satellite export license before the final go-ahead could be given. Moreover, as will be discussed later, these (multilateralized) export controls gave the U.S. government the negotiating leverage to conclude agreements with both China and Russia, which regulated launch market access of these latter countries. The Wassenaar Arrangement's proclaimed aim will discourage export of high technology goods to countries of concern. Though not supported by individual participants' veto powers, this will effect sales of satellites, including computers and encryption devices on board to such countries or regions of concern, which in turn reduces the number of clients for the launch vehicle operators.

New entry into the international launch market, and thus the possibility of an increase in competition between launch vehicle operators worldwide, has been stymied by the U.S. launch/missile technology export regulations based on the Arms Export Control Act and the Export Administration Act. Both were multilateralized by the Missile Technology Control Regime of 1987.

2.3.3 The Missile Technology Control Regime

One way of countering the risk of proliferation of weapons of mass destruction (WMD, *i.e.* nuclear, chemical and biological weapons), is to maintain vigilance over the transfer of missile equipment, material, and related technologies usable for systems capable of delivering WMD. National export licensing measures on these products and technologies make it harder for countries seeking to acquire and produce such systems to actually get what they want. But national controls, such as the U.S. ITAR, do not make much sense if such products and technologies are available from other countries which do not implement the same controls. Coordination of such national measures, or multilateralizing the controls, make these much more effective and prevent distortion of competition.

Thus, on April 16, 1987, seven Western countries, *i.e.* the U.S. and its G-7 partners, all major suppliers of missile technology sharing a growing concern with regard to the dangers of nuclear proliferation, agreed to jointly tighten restrictions on the transfer of equipment and technology used in military ballistic missiles, civilian sounding rockets and space launch vehicles to countries suspected of developing or planning to develop nuclear weapon launch systems. The seven nations concerned, the U.S., Canada, U.K., France, West-Germany, Italy and Japan, exchanged diplomatic notes and made statements confirming their adherence to a common international export policy, the *Missile Technology Control Regime*, and established a control mechanism, including an administrative framework, to give teeth to their commitment to prevent this technology from being used by - in practice particularly third world-countries to develop such "nuclear-capable missiles", or "systems (other than manned aircraft) capable of delivering weapons of mass destruction", according to the broader terminology introduced later.[263]

The MTCR has in the meantime grown to an informal and voluntary association of 32 countries which share the goals of non-proliferation of unmanned delivery systems for weapons of mass destruction, and which seek to coordinate national export licensing efforts aimed at preventing their proliferation.
The Regime rests on adherence to common export policy guidelines. These Guidelines apply to an integral common list of controlled items, the MTCR Equipment and Technology Annex. All decisions with respect to the Guidelines and the Annex are taken by consensus.

The MTCR does not take export licensing decisions as a group. Rather, individual partners are responsible for implementing the guidelines and annex in accordance with national legislation and practice.

263. *Agreement on Guidelines for the Transfer of Equipment and Technology Related to Missiles*, April 16, 1987, 26 I.L.M. 599 (1987), hereinafter referred to as MTCR or the Regime. The Regime consists of two parts, the "Guidelines for sensitive missile-relevant transfers" (the Guidelines) and the "Equipment and Technology Annex" (the Annex); the U.S. publication includes a summary of the - very detailed - annex (the Annex summary). For background information and (US) implementation measures, see *Missile Technology Control Regime,* Dept of State Press Briefing, April 16, 1987 (Extract), Doc. 31, American Foreign Policy 74-80 (1987), hereinafter referred to as MTCR State briefing. The MTCR members meet regularly to keep the Equipment and Technology Annex up-to-date and exchange views on the national application/implementation of the Regime. In 1993, a revised version of the Guidelines was adopted, which replaced the term "nuclear" (weapons) by "weapons of mass destruction (i.e. nuclear, chemical and biological weapons)", and tightened some of the criteria used.The new Guidelines became effective on Jan 7, 1993 and replaced with effect from that date the 1987 Regime, see *Missile Technology Control Regime Guidelines Revised*, Department Statement, Text of revisions, 4 (3) US Dept of State Dispatch 41-42 (1993) hereinafter referred to as MTCR revision.

Membership in the MTCR does not create an entitlement to obtain technology from another partner nor an obligation to supply such technology. In fact, the partners are expected, just as in such trade between partners and non-partners, to exercise appropriate accountability and restraint in inter-partner trade.
In making membership decisions (also by consensus), the following factors are taken into consideration:

"... whether a prospective new member would strengthen international non-proliferation efforts, demonstrates a sustained and sustainable commitment to non-proliferation, has a legally based, effective export control system that puts into effect the MTCR Guidelines and procedures, and administers and enforces such controls effectively."[264]

A country can choose to adhere to the guidelines without being obligated to join the group, and, through the years, often in preparation of full membership, a number of countries have indeed done so.

The aim of the MTCR is to restrict the proliferation of missiles, unmanned air vehicles and related technology for those systems capable of carrying a 500 kilogram payload at least 300 kilometers, as well as systems intended for the delivery of weapons of mass destruction.
The MTCR considers missiles to include: *ballistic missiles, space launch vehicles* and *sounding rockets*. Unmanned air vehicles (UAV's) include: cruise missiles, drones, UAV's and remotely piloted vehicles (RPV's).[265]
The national controls of transfers of the above and other items on the Annex (which all have been identified as contributing one way or the other to delivery systems for WMD) are implemented by evaluating applications of firms exporting these items taking into account the following factors:

" 3 ... A. Concerns about the proliferation of weapons of mass destruction;
B. The capabilities and objectives of the missile and space programs of the recipient state;
C. The significance of the transfer in terms of the potential development of delivery systems (other than manned aircraft) for weapons of mass destruction;
D. The assessment of the end-use of the transfers, including the relevant assurances of the recipient states referred to in sub-paragraphs 5.A and 5.B below;
E. The applicability of relevant multilateral agreements."
...
5. Where the transfer could contribute to a delivery system for weapons of mass destruction, the government will authorize transfers of items in the Annex only on receipt of appropriate assurances from the Government of the recipient state that:

264. See *ibid.*
265. See ACDA fact sheet *The Missile Technology Control Regime* (Sep 15, 1997) <http://www.acda.gov/factshee/exptcon/mtcr96.htm>.

A. The items will be used only for the purpose stated and that such use will not be modified nor the items modified or replicated without the prior consent of the United States Government;
B. Neither the items nor replicas nor derivates thereof will be retransferred without the consent of the United States Government."[266]

Some of the countries targeted by the Regime in 1987, such as India and Brazil, were already developing a commercial launch capability that could be turned to military uses, whereas Argentina and Pakistan were also believed to be developing launch vehicles.
Moreover, short-range missile systems and rockets, sold by both U.S.(!) and Soviet firms prior to 1987 to countries such as South Korea, Taiwan and Middle-East countries like Syria and Iraq, created a military hazard as such and were also a cause for concern. Some of these latter countries possessed sufficient know-how to develop more sophisticated and/or longer range versions of the weapons obtained.[267] Most of these so-called "projects of concern" were, in 1987, still in the design or development stage and would, in the view of the MTCR parties, be severely slowed or entirely crippled if foreign exporters did not assist them.[268]

This non-proliferation goal was to be attained by a system of export controls, applied to two categories of items, as specified in an annex: (1) complete rocket systems, including ballistic missiles, space launch vehicles and sounding rockets, capable of delivering at least a 500kg payload to a range of at least 300 km as well as the specially designed production facilities for these systems, and subsystems such as rocket stages, reentry vehicles and rocket engines; (2) components that could be used to build (sub) systems, such as, for example, missile computers and flight control systems.[269]

The category I items - the term 'item' covers both the equipment and the relevant technology - are the items 'of greatest sensitivity', creating a strong presumption to deny any transfers of the systems concerned. And the transfer of production facilities for the manufacture of category I items "will not be authorized until further notice". Or, to put it differently: category I is the *'denial list'*.
If a 'proliferator' cannot buy complete missile or launch vehicle factories or major missile components, it must assemble bits and pieces with much greater time and effort. That is where the category II list, the *'restraint list'*, comes in.

266. See MTCR revision *supra* note 263, Guidelines.
267. See AW/ST, April 20, 1987, at 28, 29 ("Seven nations curb nuclear weapon launch system exports").
268. See MTCR State briefing, *supra* note 263, at 76.
269. See MTCR, *supra* note 263, Guidelines, para. 2 and Annex summary.

As most of these latter items can also be used for purposes other than projects of concern, so-called 'dual use commodities', "restraint will be exercised in the consideration" of all transfers of such items and "all such transfers will be considered on a case-by-case basis", with particular attention being paid to the item's end use: if it is destined for a project of concern, the export application will generally be denied; if the transfer *could* contribute to a delivery system for weapons of mass destruction, assurances from the government of the recipient state are required, to the effect that:

"A. The items will be used only for the purpose stated and that such use will not be modified nor the items modified or replicated without the prior consent of the [government of the state of transfer];
B. Neither the items nor replicas nor derivates thereof will be retransferred without the consent of the [government of the state of transfer]."[270]

The MTCR is not a treaty, but establishes identical guidelines to be implemented by the members - all possessing a certain degree of sensitive missile (components) technology - in accordance with their national legislation. As outlined above, in the U.S., both the Export Administration Act and the Arms Export Control Act and their implementing regulations contained provisions controlling the export of the above items, including enforcement procedures and appropriate sanctions. Nevertheless, Congress was not impressed by these controls and, with fresh memories of the role of missiles (both on the Iraqi and on the 'allied' side) in the Gulf War, wished to strengthen the relevant provisions. Several bills were introduced - with widespread bipartisan support - in the 101st Congress with that intention, focusing in particular on additional *mandatory* sanctions against nations, companies and individuals who violated U.S. export regulations. The Bush administration was unhappy with that approach, which would take away the President's freedom of choice in reacting to inappropriate missile transfers.[271] Nevertheless, the end-product, the *Missile Technology Control Act of 1990*, which amended the above Acts, contained provisions which *require* the U.S. President to impose sanctions on U.S. and foreign persons who violate the export regulations with respect to the MTCR items and commodities as specified. Sanctions in both Acts include denial of U.S. export licenses and prohibitions on U.S. government contracts for two years or more, depending on the seriousness of the violation, with, understandably, violations involving category I systems (complete rockets or launch systems) belonging to the more serious ones.[272]

270. *Id.*, paras 1, 2, 3 and 5.
271. See *Non-proliferation regimes: A comparative analysis of policies to control the spread of nuclear, chemical and biological weapons and missiles*, by Zachary S. Davis, CRS Report for Congress (Apr 1, 1991), hereinafter referred to as CRS Report 1991, at 30.
272. The Missile Technology Control Act, hereinafter referred to as the MTC Act, became law as part of the National Defense Authorization Act, FY 1991, Pub. L. 101-510 (Nov. 5,

1990), Title XVII (Sec. 1701-1704) "Missile Technology Controls", 104 Stat. 1738-1750. The MTC Act implemented the MTCR guidelines and introduced sanctions on violations through amendments of the export license provisions of the Export Administration Act of 1979 (EAA) and the Arms Export Control Act of 1976 (AECA). More in particular, the lists of controlled goods contained in the implementing regulations, the CCL and the USML, were supplemented with the dual-use goods and technologies and other items contained in the MTCR Annex respectively. (This Annex is being reviewed regularly. The responsible agency in the US Administration is the Arms Control and Disarmament Agency (ACDA) within the State Dept. ACDA participates in US delegations to bilateral discussions, to the annual MTCR plenary meetings and to periodic meetings of technical experts, as well as in internal missile non-proliferation efforts. ACDA serves as the executive secretary to the interagency Missile Trade Analysis Group which is responsible for US interdiction efforts and missile sanctions review. ACDA members also participate in review of missile technology export licensing through the Missile Technology Export Control Group, and provide inputs to the review process of the MTCR Equipment and Technology Annex in the Missile Annex Review Committee, see ACDA Annual Report 1995 <http://www.acda.gov/reports/chap6.htm>, hereinafter referred to as ACDA Annual Report 1995, at Chapter 6.

The EAA as amended required an "individual validated license" for "(A) any export of goods or technology on the list [of the above MTCR items] to any country; and (B) any export of goods or technology that the exporter knows is destined for a project or facility for the design, development, or manufacture of a missile in a country that is not an MTCR adherent" (subsection l, para. 2). Licenses would *in general* be denied in para. 2 cases where the goods would end up in a missile developing or building facility in a non-MTCR country; and be denied if the ultimate destination was a facility in a country supporting "international acts of terrorism" (para. 3).

Both Acts, as amended by the MTC Act, provided new sanctions related to MTCR-related violations.

Thus, the MTC Act amended the EAA by inserting, under the heading "Missile proliferation control violations" a new Sec. 11B, which distinguished between (a) "violations by United States persons" and (b) "Transfers of missile equipment or technology by foreign persons" with specific trade sanctions per category as follows: if a foreign person exports MTCR items to a 'forbidden' destination, the President shall, in the case of a Cat. II item, "deny for a period of 2 years, licenses for the transfer to such foreign person of missile equipment or technology the export of which is controlled under this Act" (In other words, no US export to that country of *missile-related* dual use items) If the violation concerns the export of a Cat. I MTCR item, US exports to that country will be denied for *any* dual-use item covered by the Act, for a period of *minimal* 2 years. The President has the authority to waive the imposition of a sanction on a foreign person if he determines that such waiver "is essential to the national security of the [US]", but before doing so he will have to notify Congress and fully explain his reasons. (Para. 5) In case of similar violations by *US persons*, the latter will face corresponding sanctions, *i.e.* depending on the category of items involved in, and thus the seriousness of, the violation (MTCR Cat. I or II), they receive no licenses for exports of missile-related dual-use goods or *any* dual-use goods for a specific period of time, *i.e.* 2 years or *minimal* 2 years (Sec.11B. (a))

The AECA was amended by the insertion of Chapter 7, "Control of missiles and missile equipment or technology", containing roughly similar provisions/sanctions as the above amendments to the EAA, under the headings "Denial of the transfer of missile equipment or technology by United States persons" (Sec. 72), and "Transfers of missile equipment or technology by foreign persons" (Sec. 73).

The sanction which applies to a *US person* unlawfully trading in MTCR goods/technologies ("defense articles") on the USML as amended by the MTC Act, is, in case of trade in Cat II

In the years following the adoption of the MTCR guidelines, more and more nations joined the original seven, either by becoming a member or through declarations committing themselves to abide by the Regime; this non-proliferation policy is thus being implemented, at least in principle, by practically all major missile suppliers.[273]

items, a denial for 2 years of US Government contracts relating to missile equipment or technology, and licenses for the transfer of missile equipment or technology controlled under the AECA; in case of forbidden trade in the more sensitive Cat I missile equipment or technology, "the President shall deny to such [US] person for a period of not less than 2 years (i) all [US] Government contracts, and (ii) all export licenses and agreements for items on the [USML]." Cat. II violations by *foreign* persons result in a denial for 2 years of "(i) [US] Government contracts relating to missile equipment or technology; and (ii) licenses for the transfer to such foreign person of missile equipment or technology controlled under this Act." Cat. I violations have the stiffer penalty of a denial by the President, for a period of *not less than* 2 years of "(i) all [US] Government contracts with such foreign person; and (ii) licenses for the transfer to such foreign person of all items on the [USML]". An additional sanction is imposed in case the export/trade of the foreign person "has substantially contributed to the design, development, or production of missiles in a country that is not an MTCR adherent, then the President shall prohibit, for a period of not less than 2 years, the importation into the [US] of products produced by that foreign person" (Sec. 73. (a) (2)(A)-(C)). The President has, again, the authority to waive the imposition of these sanctions if such waiver is essential to the US national security (subject to notification to Congress).

273. Membership grew gradually. Near the end of 1989, the following additional countries had become members: Australia, Austria, Belgium, Denmark, Finland, Luxembourg, Netherlands, Norway, New Zealand, Spain, and Sweden, putting the total at 18. A RAND Corporation study published in 1993 mentioned the former Soviet Union, Switzerland, Israel and China as - additional - countries that had agreed to abide by the MTCR guidelines. The same study quoted a U.S. government official's statement of April 1992 before a Congressional committee to the effect that Poland, Hungary, Czechoslovakia, Romania, and Bulgaria had already adopted, or were in the process of adopting, controls comparable to those of the MTCR; this left only North Korea as the remaining major missile supplier outside MTCR, a lonely position which the author expected to be of a temporary nature only, see Brian G. Chow, *Emerging national space launch programs - economics and safeguards*, National Defense Research Institute, RAND, U.S.A. (1993) [hereinafter cited as RAND study] at 2. A Pentagon official, in August 1993, put total MTCR membership at 23, and voiced the expectation that Argentina and Hungary would join in the not too distant future, see 4 (32) Space News (Aug. 1993) at 1. A statement issued by MTCR after its Mar 8-11, 1993 plenary session in Canberra, welcomed Iceland as member number 23, agreed to invite applicant countries Argentina and Hungary to become Partners, and listed the following members: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the US, see 4 (14) US Dept of State Dispatch (1993) at 206. In November 1997 the number of participating countries had increased to a total of 29 (including but only after years of complicated US- (Soviet-) Russian talks, Russia): Argentina, Australia, Austria, Belgium, Brazil, Canada, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Russia, South Africa, Spain, Sweden, Switzerland, Turkey, U.K. and the U.S, see *Commonly asked questions on the ... (MTCR)*, ACDA fact sheet

There is general agreement amongst experts and policy makers alike that it is virtually impossible to distinguish between peaceful space launch technology and offensive missile technology (and, in fact space launchers are simply surface-to-space ballistic missiles).[274] If that is a fact, then technical assistance to a nation's space launch program - either through direct sales of launchers, rocket engines and/or the relevant technology or through a bilateral cooperative launcher development programme - is as potentially 'proliferatory' as selling ballistic missiles (technology) to its military establishment.

Thus, although the MTCR states that "the Guidelines are not designed to impede national space programs or international cooperation in such programs as long as such programs could not contribute to nuclear weapons delivery systems", this is a matter of interpretation: a country enforcing the guidelines can conclude that its decision has made the world a safer place while the 'victim' country decries the same decision as one causing an unwarranted set-back to its peaceful space (launch) program.

An example of the latter category is *India*, a country with an advanced and consistently government- funded space program, both a -modest - seller of space goods in its own right and a buyer of U.S. satellite components. Inda has the technological know-how, the cost-consciousness and the ambition to obtain independent access to space for its own satellites.[275] To that end, since

<http://www.acda.gov/factshee/exptcon/fs.htm> (Nov 26, 1997). In a May 1998 "Reinforced Point of Contact (RPOC) Meeting", the MTCR partners reached consensus to admit the Czech Republic, Poland and Ukraine to membership in the MTCR, bringing total membership to 32, see Text of a letter from the President to the Speaker of the House of Representatives and the President of the Senate, The White House, Off. of the Press Secretary (Nov 12, 1998)
<http\\www.pub.whitehouse.gov/urires/TzR?urn:pdi://oma.eop.gov.us/1998/11/16/9.text.1 >India, though both a missile and launcher manufacturer, has not joined yet.

274. At the Dept of State briefing on MTCR it was put as follows: "Space launch vehicles, for instance are virtually interchangeable with ballistic missiles. When President Kennedy was asked the difference between the Atlas rocket that put John Glenn into orbit and an Atlas rocket armed with a nuclear warhead and aimed at the Soviet Union, he replied with one word-'attitude'.", see MTCR State briefing, *supra* note 263, at 75.

275. India has built remote -sensing satellites and ground equipment, and telecommunications satellites. In 1992, Indian officials mentioned remote sensing data, propellant tanks and launcher propellant as - potential - export products, see 3 (17) Space News (May 1992) at 1, 21. In December 1994, Intelsat decided to lease more than half the transponder capacity of an Indian Insat 2E communications satellite to be launched in 1997 to cover its telecommunications needs in the Asia-Pacific region. Under the contract Intelsat would pay India $ 100 million over a 10-year period, see 6 (1) Space News (Jan 1995) at 16 . For a more extensive account of - the development of - India's space applications program, including launchers, see the series of articles on "Indian Space" in 3 (18) Space News (May 1992) at 14, 15, 3 (19) Space News (May 1992) at 14, and 3 (20) Space News (May 1992) at 11. India aimed, with its own rocket, to bring launch costs down to about one third of western launch prices, see 4 (28) Space News (Jul 1993) at 3. Whether the PSLV it has developed in the meantime now meets that requirement is a matter of debate; and whether its

1984, India has been developing its own launch vehicles, one of which is the Geosynchronous Satellite Launch Vehicle. For the so-called cryogenic upper stage, the Indian Space Research Organization (ISRO), in the late eighties, after talks with General Dynamics and Arianespace had failed, turned to the Russian space agency Glavkosmos and finally signed an agreement in November 1990 for the sale of two such engines to be delivered in 1994/1995, with future engines to be built by ISRO itself, based on the technology transferred by the Russians under the agreement.
The State Department considered the sale of this engine, which according to its arms control experts could be used to propel ballistic missiles, a violation of the MTCR guidelines and, by virtue of the Arms Export Control Act and the Export Administration Act, as amended by the Missile Technology Control Act, prohibited with effect from May 6, 1992 for two years all exports of U.S. made components to Glavkosmos and to the Indian organization.[276] The embargo was applied by both the State Department and the Department of Commerce. It also affected contracts already signed and would, according to ISRO officials, delay the manufacturing and launch schedule of its domestic communications satellites Insat 2C and 2D. ('delay', because the components would have to be obtained elsewhere in the world aerospace industry, and obviously from a country which did not abide by the MTCR rules, either as an outsider or as a member with a different interpretation of the law or the facts). ISRO rejected the U.S. government assertion that the Indian launch program was closely linked with military ballistic missile efforts, and maintained that there was a complete separation between civilian space launch and military missile efforts.[277]

GSLV will do so also remains to be seen. But low cost is not its highest priority: India's main goal with its space effort in the 1960's was to accelerate national development; and more recently, it was formulated along, *inter alia*, the following lines:
"sustain and grow autonomous national space capability by virtue of India's size, diversities and development needs; enable strategic and leading edge technology development; realize economic benefits and promote sustainable space industry", etc. That is why India builds both satellites and launch vehicles, see speech ISRO Chairman, IAF Melbourne Congress (Sep 28, 1998), hereinafter referred to as ISRO Melbourne speech.

276. The State Dept issued the following statement: "... The MTCR partners all have concluded that the Glavkosmos-ISRO deal is inconsistent with the MTCR guidelines. That is why they have urged that this deal not go through ... Since the facts are clear and since the parties to the transaction have declined to terminate these activities, the [US] has imposed sanctions in accordance with our law. The sanctions are: -a 2-year ban on all US-licensed exports to these entities (i.e., Glavkosmos and ISRO); a 2-year ban on all imports into the [US] from these entities; and a 2-year ban on US Government contracts with these entities ... We have explained to both governments that termination of the Glavkosmos-ISRO deal could permit us to consider a waiver of these sanctions.", see *Russian sale of rocket engine to India*, Statement by Department deputy spokesman (May 11, 1992), US Dept of State Dispatch (May 18, 1992) at 386. For the legal basis, see AECA and EAA as amended, *supra* note 272. See, for press report on the sanctions, 3 (19) Space News (May 1992) at 14 ("U.S. sanctions imposed; India deal with Russia still on"); for - further - background, see 3 (18) Space News (May 1992) at 1, 28 ("U.S. sanctions target Indian, Russian programs").
277. See above press reports. The ISRO chairman, in an interview after the imposition of the

The sale of the engine went through as planned, and India bought the components it needed from companies outside the United States. The U.S. measures, which were apparently not sufficiently supported by corresponding measures of the other MTCR members, drew strong reactions from American industry. At a Congressional hearing on "Export control reform in high technology" of August 1993, a representative of the American Electronics Association voiced, on behalf of 3000 American high technology companies involved in electronics, his frustration about the effects this imposition of unilateral controls had produced for U.S. industry:

"... the parties most hurt by this decision have been U.S. companies. After some fifteen months, exporters are still unable to export even such basic goods as pencils to I.S.R.O. ...
In the meantime, our European and Japanese competitors have had no difficulty filling the void ...
When customers such as I.S.R.O. are no longer able to obtain needed goods from U.S. industry, they turn elsewhere and often make permanent decisions not to 'buy America' ... Our government should quit playing the Pied Piper expecting others to quickly follow in line with us after we have imposed controls unilaterally."[278]

A similar case erupted in June 1993, when the State Department determined that the Russian firm KB Salyut was directly involved in the sale of liquid-fueled rocket engines to India. This time, the controversy was more complicated. What remained the same were the desparate financial needs of the Russian aerospace industries, which therefore were as eager as ever to sell any hardware and/or technology to any customer willing to pay in hard currency. On the U.S. side, the existing non-proliferation worries were joined by the concern that the Russian space industry, with all its advanced technology and expertise, if unassisted, would be successively sold, in bits and pieces, to the highest bidders amongst which were suspected to be particularly those countries whose technological advances the MTCR tried to curtail.
For that reason, the U.S. was trying to get Russian manpower, space technology and hardware involved in the Space Station program (with the welcome side-effect of a possible interesting reduction of the much-criticized astronomical cost of the project). For the same reason, negotiations were taking place on Russia's entry into the international commercial launch market

sanctions, expressed particular anger at the retro-active character of the ban, and rightfully pointed out that this aspect of the measure would undermine the credibility of the U.S. space (components) industry in international markets. The American companies affected by the sanction, Lockheed and Hughes, were reported to challenge the retroactiveness of the ban, which was only applied by the Commerce Department, see 3 (26) Space News (Jul 1992) at 9 ("Embargo threatens India's space program schedule").

278. See *Export Control Reform in High Technology*, hearing before the House Committee on Science, Space and Technology, 103rd Cong., 1st Sess. (Aug. 13, 1993) hereinafter referred to as High technology hearing, 123-131 (statement of Ms. Derrel de Passe) at 127-128.

in such a way that the Russian launch industry would be able to sell launch services without their U.S. counterparts being unduly damaged as a result. (See next Chapter)

An additional complication were the new links that had been forged among the Russian industries and also between Russian and U.S. companies: a ban, depending on its scope, could apply to all and effectively halt all space cooperation, whether on an intergovernmental or private level, between the U.S. and Russia.[279]

The compromise reached in July 1993 between Prime Minister Chernomyrdin and Vice President Gore saw India at the loosing end. It was agreed that the Russians could sell a number of rocket engines to ISRO, but would not be allowed to sell the technology that India needed to manufacture the engines independently. Russia at the same time agreed to henceforth abide by the MTCR guidelines. New sanctions were thus averted (the original sanctions against Glavkosmos and ISRO remained in place for the remainder of the two year period, *i.e.* until May 6, 1994), and the planned space cooperation between Russia (without participation of Glavkosmos!) and the U.S., as outlined above, was safeguarded, to the undisputable benefit of both, but to the - financial - relief of particularly the former and the 'security' relief of the latter.[280]

279. KB Salyut, which designs the Proton rocket, merged with Khrunichev Enterprise, Proton's manufacturer; the latter concluded an agreement with Lockheed to jointly market the Proton rocket outside Russia. NPO Energia, which builds the fourth stage of the Proton rocket, in July 1993, agreed with Rockwell to build a docking unit and provide technical services for a joint Mir and space shuttle mission; and United Technologies Pratt & Whitney concluded a marketing agreement with Energomash of Moscow which builds rocket engines, see 4 (27) Space News (Jul 1993) at 1, 20 ("U.S. may slap new sanctions on Russia").

280. Preceded by an understanding reached by the US and Russian presidents in Vancouver on Apr 3-4, 1993, Vice President Al Gore and Prime Minister Chernomyrdin, on Sep 2, 1993 concluded a number of related cooperation agreements. Most important in the context of this Chapter were a joint statement on space cooperation, particularly addressing Russia's participation in the international space station program (which promised work/money for the embattled Russian space industry), a bilateral launch trade agreement giving Russia access to the international launch services market (promising work/money for the Russian launch industry) and a M.o.U. on missile-related exports, in which Russia agreed to abide by the criteria and standards of MTCR. The Fact Sheet released by the office of the Vice President added somewhat cryptically: "We also reached an understanding on the disposition of Russia's cryogenic rocket engine contract with India. We expect a final arrangement on this issue to be reached by the beginning of next year", see Fact Sheets, *Joint statements on space cooperation, aeronautics and earth observation*, Office of the Vice President (Sep 2, 1993), Gorove US Space Law, *supra* note 55, at I.A.4 (a-2). See also Testimony of John H. Gibbons, Director, Office of Science and Technology Policy, before the House Subcommittee on Space Science and Applications (Oct 6, 1993) <http://www.whitehouse.gov/WH/EOP/OSTP/other/ts931006.html>. Before the deal was made, an editorial qualified the *quid pro quo*, along the lines of the U.S. State Department views on the matter, as follows: "If space cooperation and market access is the prize that

India's loss was not so much a matter of now lacking the hardware as such, but of being deprived of the technology and having lost two precious years in which they could have worked on the development of their own engine; which of course was exactly what the MTCR aims were all about.[281]
In October 1993, the Russians formally cancelled the engine contract altogether, citing legal provisions in the contract.[282] India, at the same time, continued to autonomously develop and test two other families of smaller launch vehicles, and it was generally expected that neither the mixed results of the latter, nor the above cancellation of the engine contract would lessen its drive to build an independent launch system.[283] (And in fact, on September 29, 1997, India reached a milestone with the first operational launch of its Polar Satellite Launch Vehicle. The payload was an Indian earth-imaging satellite, which underscored that country's increasing independence from

will get the Russians' attention on issues like the [MTCR], then the Clinton administration should use it to put the pressure on full force. A little heavy-handedness by the [U.S.] now could avert many potential crises for decades to come, if missile proliferation goes unchecked due to Russian greed", see 4 (27) Space News (Jul 1992) at 14 ("Commentary").

281. That result may have been overstated: according to Henry Sokolski, former deputy for nonproliferation policy in the Pentagon, in July 1993, Yeltsin promised Clinton to reconfigure Russia's contract with ISRO by Nov 1, 1993, so it would exclude any transfers of production technology. But between July and October Russia, according to Indian officials, transferred more than 4/5 of the sanctioned production technology and sent its 'drawings of the engine' in Sep 1993 that would enable India to produce the engines within a few years, see 9(21) Space News (May 1998) at 11.
U.R. Rao, the ISRO chairman, said in an interview in 1993 that "without the technology transfer this contract is not worth much ... The technology is the heart of this contract". According to the same official, India had agreed with Russia that the engine technology would not be transferred to third parties, and that it would be used exclusively for peaceful purposes, see 4 (28) Space News (Jul 1993) at 3 ("Russia backs away from India deal"). That latter commitment would not have satisfied the U.S. which considered India itself a country that should not be assisted in building up launch technology; in the American view, countries like India should be allowed their legitimate access to space through U.S. and other launch services at reasonable prices. In the same vain, Russia, as part of its fence-mending efforts vis-à-vis India, offered inexpensive launches of Indian communications satellites aboard Proton rockets "which would give India time to complete its new vehicle using Russian engines and eventually its own domestically built engines". See *ibid.* The launch price argument did play a role - though not a decisive one - in India's decision to build an indigenous launch vehicle, see *supra* note 275.

282. Information provided by an ISRO spokesman as quoted in 5 (11) Space News (Mar 1994) at 3.

283. *Ibid.* and see 4 (38) Space News (Sep-Oct 1993) at 1, 28 ("India's rocket effort falters"). Shortly after the date of expiry of the 1992 sanctions, in May 1994, India and Russia were reported to have signed a revised contract giving India four cryogenic engines, with an option for three more; at the same time India had begun its own engine development program. The Russian engines would be incorporated into India's own geostationary space launch vehicle to be ready for a first launch in 1996 of an Insat communications satellite built by ISRO. Under the terms of that latter agreement, the *technology* for the engines would not be transferred to India, see 5 (18) Space News (May 1994) at 3 and 5 (22) Space News (May/Jun 1994) at 2.

western space technology, at least as far as 'official' transfers are concerned).[284]
India's military scientists in the meantime continue the development and testing of 'real' ballistic missiles, for air defense purposes and to counter the threat posed by Chinese-made M-11 missiles deployed by Pakistan.[285] (As discussed in Chapter 3.1 on U.S. -China launch relations, the alleged M- 11 sales to Pakistan also brought about U.S. - imposed MTCR sanctions directed against China).

Other countries subjected to MTCR controls
A 1993 RAND Corporation study on emerging national space launch programs put India, Brazil and Israel in the same class of countries which have made substantial investments - in manpower and money - in both civil space launchers and ballistic missile programs. The report addresses the economic viability of the space launch program of one of these countries, Brazil, and concludes that the prospects for making profits from its space launch business are very poor. This conclusion extended to India and Israel as well, and applied *a fortiori* to the planned launch activities of a second group, whose programs were still in the early stage of development or planning, with investments significantly less than those in the first group: South Africa, Iraq, South Korea, Pakistan, Indonesia, Taiwan and Argentina.

The study argued convincingly that the poorer the economic prospects, the less uncomfortable the U.S. and other MTCR members would be in exercising export controls and in - thus - stemming the flow of launch technology to the countries concerned.[286]

Two countries belonging to the second group were believed to have cancelled the development of indigenous launchers as a consequence of MTCR-inspired launch technology export license refusals on the part of the U.S., *viz. Taiwan* in 1990, and *South Africa* in 1993, with in the latter case "[p]oor commercial prospects for the vehicle [having] speeded the cancellation."[287] A third country, *Argentina*, cancelled its 'Condor 2' ballistic missile program, also for

284. See 8 (47) Space News (1997) at 6. More recently, an ISRO official, without acknowledging the extent of the ensuring delays, observed that the MTCR affair had been blessing in disguise, because it forced India to develop its own launch technology, see Mukund Rao, Deputy Director, at IMF Melbourne Congress (convers. with the author). As for the issue of (non-)proliferation of launcher technology India made it one of the more important issues for 'space policy adjustments'. As recently stated by ISRO, "we take into account international concerns [*re* proliferation of launch vehicle technologies] and have national regulations taking care of those", see ISRO Melbourne speech, *supra* note 275.
285. See IHT (Jun 6, 1994) at 6 ("India test-fires missile, ignoring U.S. opposition").
286. See RAND study, *supra* note 273, at 4, 8.
287. See AW/ST (Oct 22, 1990) at 11 ("Taiwan scraps booster plans"); AW/ST (Jul 5, 1993) at 21 and 4 (32) Space News (Aug 1993) at 1 (*re* South Africa).

MTCR-related reasons, though planning to pursue 'peaceful use' of Condor technology.[288] Argentina became member of MTCR in 1994, and South Africa joined one year later.

As for the countries in the first group, the Rand Report noted that *Brazil*'s space launch program had experienced delays because of the non-availability of components due to MTCR and, without technical assistance, could be further delayed or even cancelled.[289] The latter (*i.e.* cancellation) did not materialize: Brazil became member of MTCR in 1995, and continued the development of its civil launcher, though with limited success: the *Veiculo Lancador de Satellites'* launch on November 2, 1997 failed at lift-off. The Brazilian space officials maintained their plans to build at least three more rockets of this type.[290] In 1995, also the *Russian Federation* - finally - joined the Regime, though, until today, the government's export controls are far from leak-proof, reportedly resulting in missile technology and expertise being sold by Russia's industries to Iran. The latter's considerable WMD capabilities, particularly extended-range missiles and chemical weapons, and its continuing efforts to enhance those capabilities are seen as a substantial threat to neighboring states and to U.S. installations in the region. The U.S. government therefore continues to press upon Russia to tighten its export regulations and enforcement. This pressure has apparently resulted in the Russian government

288. See RAND study, *supra* note 273, at 7, 8. See also McCall *supra* note 232, at 64: "One Argentine program involving several large European companies, Iraq and Egypt was finally halted in 1990, amid mounting diplomatic pressure, scheduling breakdowns, financial shortfalls and technical difficulties attributed in large part to the Regime's efforts". In his address to the 48th Session of the UNGA on Sep 27, 1993, President Clinton stated: "I am proposing as well new steps to thwart the proliferation of ballistic missiles. Recently, working with Russia, Argentina, Hungary and South Africa, we have made significant progress toward that goal. Now, we will seek to strengthen the principles of the [MTCR] by transforming it from an agreement on technology transfer among just 23 nations to a set of rules that can command universal adherence", see Address by the President to the 48th Session of the [UNGA], White House Press Release (Sep 27, 1993), The White House Virtual Library <http://library.whitehouse.gov/cgi...> Though the latter goal was rather ambitious, Argentina and Hungary joined in 1994, followed by Brazil, South Africa and, finally and of considerable importance, the Russian Federation in 1995, which at the end of that year brought total membership to 28, see ACDA Annual Report 1995, *supra* note 272, at Chapter 3 ("Controlling missiles and space weapons") Turkey is mentioned as the 29th member in various 1997 State Dept documents on the subject.

289. See RAND study, *supra* note 273, at 50. A Brazilian author, some years later, confirmed the effect of MTCR on the Brazilian space program and, more in particular, on the development of its national launch vehicle. In the same article the (then) Brazilian president is quoted stating, in 1988, at the occasion of the signing of a Protocol on space cooperation with China, that this cooperation "could brake those restrictions the developed nations had built against the advanced technologies transfer", see Jose Monserrat Filho, *Brazilian-Chinese space cooperation: an analysis of its legal performance*, Proceed. 39th Colloq. L. Outer Space 164-175 (1996).

290. See 8 (47) Space News (1997) at 22. Prior to joining MTCR, Brazil had enacted the required domestic missile/launcher export control legislation.

taking initial steps - and making commitments to take substantial additional steps - "to crack down on Russian entities supplying missile technology to Iran."[291]

Israel's special military and security relations with the U.S. make the former an unlikely candidate for being subjected to the strict application of the MTCR guidelines. As Israel's ballistic missile program is well-advanced and operational, and strategically acceptable to at least a number of MTCR members, additional missile technology will be accessable to Israel's military establishment. This makes the limiting of civil launch technology transfers under MTCR rules - for fear of this technology being used for the development of missiles - a bit frivolous to say the least. The RAND study concludes that the economic prospects for Israel's indigenous space launcher 'Shavit' are as poor as Brazil's, and there is little reason to believe that it will either be developed as an autonomous commercial launch system or be an attractive candidate for a joint venture with another MTCR member. (As a country that abides by the Regime itself, it would not be allowed to share its launcher technology with a non-member.) Nevertheless, development for domestic purposes continues (though with limited success: a January 1998 launch of the Shavit, carrying an Ofek 4 imaging satellite, failed due to a malfunction in the rocket's launch sequence)[292] and, as we saw in Chapter 1, a U.S. company is using Shavit design and technology to build a U.S. version for sale in the (U.S.) launch market.

Japan's activities as a launch nation were made possible by a cooperative agreement concluded in 1969, which enabled Japan to use (U.S. Delta-derived) N-1 and N-2 launch vehicles built in Japan under license from McDonnell Douglas. By virtue of the agreement, Japan was given access to this technology and equipment on condition that the launch vehicles would only be used for peaceful purposes, and could not be used to launch satellites for other countries without U.S. permission.[293]

291. See Oakley testimony, *supra* note 190, at 3. As the State official further observes, "[e]vents over the past years [i.e. 1997] have demonstrated the ability of would-be proliferators, notably Iran, to exploit Russia's missile development infrastructure. If allowed to continue, access to Russian technology and expertise will enable the Iranians to develop and field intermediate range ballistic missiles faster than if they were left to their own devices." In her testimony, the speaker noted the economic/financial circumstances which had a strong influence on Russia's behaviour: "... economic realities are such that Russia perceives the need to export arms in order to maintain its arms industry, and Moscow continues to try to expand sales to old and new customers alike", *id.*, at 8-9.
292. See 9 (6) Space News (1998) at 18.
293. See Marcia S. Smith, *Space Activities of the [U.S.], CIS, and other launching countries/organizations*: 1957-1993, CRS Report for Congress (Mar 29, 1994), hereinafter referred to as Smith, CRS Report 1957-1993, at 163. See also Masahiko Sato, *The Japanese legal framework: Third party liability resulting from NASDA launch activities*, IISL-98-IISL.2.05, IAF Melbourne Congress, *supra* Chapter 1, note 31.

Where the latter condition, in view of the year of the agreement's conclusion, was probably more foreign policy related than commercially-oriented, the former had a clear non-proliferation purpose. This was supported by a Diet resolution in the same year which prohibited Japan from pursuing space programs for other than peaceful purposes. A *bona fide* interpretation of both agreement and resolution would rule out the use of the Delta technology for missile-related purposes of Japan and/or export of that technology to countries with missile programs *in statu nascendi*. Its dependence on U.S. permission to launch foreign payloads, created the understandable wish to have an indigenous, 100% Japanese launcher. Hence the development of the H-class launch vehicle, the first version of which, the H-1, still contained U.S. components bringing it under the restrictions of the 1969 agreement. The H-2 which replaced its predecessor after February 1992 is entirely Japanese and makes the relevant part of the 1969 agreement - insofar as it still exists - obsolete. Its export control element had been taken over by MTCR of 1987, of which Japan was one of the founding members. This did not prevent the State Department, in 1996, from temporarily holding up the sale by the U.S. aerospace company Thiokol of (USML-listed) technology which Japan needed for the upgrade of its H-2 launch vehicle. Although brandished by the trade press at the time as a case of "proliferation paranoia"[294] (which it possibly was), it (also) served to confirm that MTCR does not create a right for members to obtain launch or missile technology from other members and that U.S. MTCR-related export control regulations subject such deliveries to a case-by-case review even when the recipient state is an MTCR friend and ally. In this connection it is worth quoting Clinton's 1993 non-proliferation policy on which this approach is based:

"The [U.S] will not support the development or acquisition of space launch vehicles in countries outside the MTCR. For MTCR member countries, we will not encourage new space launch vehicle programs which raise questions on both non-proliferation and economic viability grounds. The [U.S.] will, however, consider exports of MTCR-controlled items to MTCR member countries for peaceful space launch programs on a case-by-case basis."[295]

The above is standing U.S. policy, confirmed as such in *e.g.* the Annual Reports of the ACDA.[296]

294. See Space News Online (Sep 30, 1996) at 12 ("Proliferation paranoia") <http://www.spacenews.com/spacenews/smembers/sarch/sarch96/sn093085.htm>
295. See *Non-proliferation and export control policy*, Fact Sheet, White House, Office of the Press Secretary (Sep 27, 1993), 4 (40) US Dept of State Dispatch 676-677 (Oct 4, 1993) hereinafter referred to as 1993 non-proliferation policy, at 677. See also Chapter 2.3.4 *infra*.
296. See *e.g.* ACDA Annual Report 1995, *supra* note 272, at Chapter 3 ("Controlling missiles and space weapons"): "As a matter of policy, the U.S. does not encourage new space launch programs, and U.S. exports to foreign space programs are reviewed to ensure that they will not contribute to a missile program of proliferation concern."

It nevertheless remains remarkable that a trusted U.S. ally would receive treatment usually reserved for countries of more pressing proliferation concern.

A Congressional report of 1991, apart from confirming a number of 'successes' of the Regime, also mentioned that MTCR had made Germany tighten its export control law and investigate charges that its nationals had engaged in smuggling missile technology to developing countries. It noted further that Italy had taken legal action against alleged missile technology smugglers, and a number of other European countries, Japan and Australia had reviewed and tightened their export control systems. But the report also criticized the MTCR members for inconsistent and uneven application of their national export controls, cited companies and individuals in France, Germany, Israel, Italy, Japan, South Africa, the Soviet Union and the United States for having transferred entire systems, components, materials or technical information to other countries engaged in missile development, and brandished the Regime as not comprehensive or leakproof, not restricting all relevant missile technology and lacking verification and enforcement mechanisms. The 1991 report finally warned of the growing number of non-MTCR states producing ballistic missiles with indigenous technology, increasingly less dependent on imported materials and forging alliances with other developing nations seeking to develop or purchase their own missiles.[297]

The above developments in the membership of MTCR between 1991 and 1995 implied that, of the countries which remained outside and were at the same time considered significant potential suppliers of missile technology, China and North Korea were considered the most actively 'proliferatory', with Middle Eastern countries Iraq, Iran, Libya and Syria identified by the U.S. intelligence community as eager clients, and South Asian adversaries India and Pakistan equally determined to acquire the technologies necessary to keep a balance of threats.[298] The latter two countries were considered different in at least one way: where Pakistan was seen as an importer of missile-related goods and technology (mainly from China), India continued its development of indigenous ballistic missiles. At the same time India persisted in building its own *civil* launch capability, notwithstanding the MTCR controls, thus creating the interesting option for the U.S. and the other MTCR members to consider the latter activity as of lesser relevance for non-proliferation purposes (something India has always maintained) and therefore fit for a relaxing of controls, if not for cooperative ventures in the field of launching. On the other hand, it cannot be denied that a country's determination to develop or improve its missile capabilities make any outside-imposed creation of a 'Chinese wall' between that industry and its civil launch cousin largely illusory. (One has only to think

<http://www.acda.gov/reports/chap3.htm>.

297. See CRS Report 1991, *supra* note 271, at 28.

298. See Oakley testimony, *supra* note 190, at 10,5 resp.

about a carreer move of an experienced civil launch engineer to the military establishment, a domestic conference on launch technology or research contracts for a domestic university's space (propulsion) technology department). Even a weak bout of proliferation paranoia may therefore disqualify a country as importer of launch technology for the only reason that there is thought to be a military establishment interested in missile development.

Understandably, the countries affected strongly criticized the Regime as discriminatory, unnecessary and burdensome.
An early view from India - one of the more vocal members of the above group of emerging space powers - probably reflected the prevailing sentiment among its fellow-members when it comes to determining the effects of the MTCR export controls. After having defended the right of the developing countries to follow the developed states in using outer space for military purposes, it challenged as unacceptable the underlying premise of the Regime "that only certain countries have the wisdom and sagacety to handle complex weapon systems."[299] It then identified the two main negative effects of an MTCR embargo: (1) it makes the affected country even more determined to achieve self-reliance in the missile field, and strengthens the hands of the 'hawks' in this respect, and (2) it affects (world) trade in the civilian space market and gets in the way of meaningful economic cooperation in that sector.[300]
A reaction to the first point may be that the draftsmen of the Regime, far from being convinced that it would stop missile proliferation altogether, are content with making it as difficult as possible for a missile technology-hungry country to obtain the right material at the right time and at acceptable cost, and will react to 'hawkish' behaviour with even more determination to implement the embargo, forcing the country concerned to turn to non-MTCR salesmen for - possibly - less reliable goods at higher cost.[301]

299. See S. Chandrashekar, *Missile technology control and the third world - are there alternatives?,* 6 (4) Space Policy 278-284 (1990) at 279. In the same vain Boutros-Ghali, *International cooperation in space activities for enhancing security in the post-cold war era,* report of the Secretary-General, UN, Dept of Political Affairs, A/48/221 (undated): "In recent years some states have taken steps, both individually and multilaterally, to halt the proliferation of advanced military technologies, most notably through the [MTCR] and other supply-side controls. However, these measures raise international political problems because they are perceived by many countries of the world to be inequitable ... As with other elements of proliferation control and disarmament, any controls must be non-discriminatory and generally acceptable, if they are to be effective", at 9-10.
300. *Id* at 280.
301. See McCall *supra* note 232, which, apart from referring to the cancellation of Argentina's Condor 2 project, also mentions the ballistic missile programs of India ('Agni') and Brazil ('Avibras') as "[having] been effectively hindered by the regime", and Iraq's missile production efforts as having been thwarted in large part by MTCR-related pressure on exporting companies and countries, *id.* at 64, 65. And a State Dept official in 1989 stated: "The MTCR has had a substantial impact on some developing programs which rely heavily

As to the second point, there is no denying that the MTCR premise, that no meaningful and effective distinction can be made between military missile technology and civil launch technology, affects trade in space (launch) goods and services and makes cooperation in that field a complicated and highly uncertain affair. No matter how utterly peaceful a launch program may be, the dual-use conundrum turns it into a suspected activity, to be feared and resisted, particularly of course where the country concerned is also known or suspected to be of the missile-seeking type. The ironic result in the latter case may be that a country, confronted with the high cost, complexities and uncertainties of the build-up of both a civilian launch and a military missile capability, will, if for economic reasons forced to choose, for (regional) security and strategic reasons opt for maintaining the latter rather than the former program.

Missiles-turned-launchers

A related issue with a MTCR angle is the control of missiles converted into and used as civil launch vehicles.

An early example is Space Commerce Corporation of Houston, Texas, which on July 29, 1989, signed an M.o.U. with Technopribor, a Soviet Consortium set up to export previously classified technology related to the production of medium range SS-20 (nuclear capable) missiles. The two agreed to develop and market a new commercial launch vehicle based on this missile, the *Start* (not to be confused with the Strategic Arms Reduction Treaty for which the same acronym is used). Initial discussion within the U.S. government focused primarily on the *arms control* aspect, i.e. the possibility that the Soviet Union would (continue to) produce missile-type vehicles 'disguised' as civil Start launch vehicles and therefore not counted as real missiles for arms limitation purposes. (The 1987 INF (Intermediate-Range Nuclear Forces) Treaty requires the U.S and the Soviet Union to eliminate all intermediate-range missiles (IRM's), shorter-range missiles (SRM's), associated launchers, equipment, support facilities, and operating bases worldwide. The START Treaty of July 1991 has similar objectives: "... The joint venture would provide the Soviets with an 'escape clause' for the INF and START treaties since it would allow Moscow to keep producing missiles with potential military applications ... [and would] add enormously to the verification burden."[302]

on the import of foreign technology. For example, the Argentine/Egyptian/Iraqi Condor II missile is far behind schedule due, in part, to the MTCR.", see *The Bush Administration's Nonproliferation Policy,* Prepared statement by the Under Secretary of State for security assistance, science and technology (Bartholomew), May 18, 1989 (Extracts), Doc. 21, American Foreign Policy 65-68 (1989), hereinafter referred to as State Dept nonproliferation statement, at 67.

302. See M. Potter, *Swords into ploughshares: legal, policy implications of a commercial launch vehicle based on the SS-20 missile*, Proceed. 33d Colloq. L. Outer Space 48-57 (1990)

The issue of *high tech export control* would most likely arise if the launches were to take place outside U.S. territory and the payloads involved U.S. satellites or satellite components. A further distinction was rightfully made at the time between launches from CoCom member countries' territory on the one hand and other foreign territory, such as (then) Warsaw Pact countries' territory. Obviously, the latter launches would have been impossible because of applicable CoCom-wide upheld AECA and EAA export restrictions to these countries. For launches from a U.S. launch base, different permits would have been necessary, such as a DOT license for this new launch provider and *import* licenses under AECA/ITAR for each Start launch vehicle.

The production of new, inexpensive, missile-derived launch vehicles would also have missile proliferation aspects related to MTCR purposes. Where the transformation of missiles into civil launch vehicles as such may be considered a positive non-proliferation step, as it replaces a military application by a civil one, the 'downside' could be the possible transfer or sale of these launch vehicles to countries which do not possess either missile or launch technology and would thus become an additional proliferation hazard. This would be of particular relevance if the plans of the initiators were to materialize, *i.e.* "... to be able to launch from the customer's launch site, or from his driveway, if he wants to."[303] But the proponents argued that the partners would not be selling the rocket or the technology, but only the launch service, thus removing any possibility of the project becoming an MTCR issue. Obviously, from a non-proliferation policy point of view this was hardly a satisfactory assurance. The most appealing MTCR-related argument *in favour* of missile conversions such as the Start project would appear to be the following: the more conversions of missiles take place the more competition will result in the commercial launch market, both domestic and international, and the more competition there is, the lower the launch prices *and the lesser the need for have-nots to start their own launch industry and become potential proliferators themselves*. As Potter rightly observed:

"If the U.S. encourages the Soviets to provide inexpensive launches on the World market this may take the incentive away from developing countries to produce indigenous launch capabilities. Once these countries succeed in developing their own launch capabilities they often are forced to sell missile technology to other developing countries in order to defer their initial development costs."[304]

The issue of *unfair competition* created special concerns which led to the U.S. administration's regulatory interventions. A distinction should be made here between *foreign* and *U.S.* missiles-turned-launcher. The former deepened

hereinafter referred to as Potter 33d Colloq., at 49.

303. *Id.*, at 53.

304. *Id.*, at 54.

existing worries of the U.S. launch companies about the effect of foreign non-market economies' pricing of (new) launch services on their business. As we saw above, the U.S. launch industry, in the late eighties and early nineties was considered by many, including the companies themselves, an 'infant' industry, engaged in a competitive struggle *inter alia* against Arianespace. A strong need was felt for protection against any newcomers, but particularly against low-cost launch services 'dumped' on the western markets by centrally planned economies. (This trade issue will be further explored in Chapter 3.)

But, given the existence of tools for protecting the U.S. companies through the application of the U.S. export control laws, it was, in the early nineties, particularly the prospect of competition created by *U.S.* missiles-turned-launchers against U.S. companies operating in the same (small launcher) market segment in which the newcomers would be active, which sollicited the more critical reactions, and which would give rise to policy statements on the part of the U.S. administration trying to assuage the incumbents' fears. The latter was triggered by the *Lodestar* project devised by Lockheed Missiles and Space Company and consisting of retired U.S. Navy Poseidon missiles to be refurbished and adapted to civil use, *e.g.* for the launch of small - initially only governmental - scientific satellites.[305]
The initiative brought strong reactions from Orbital Sciences Corporation (OSC), a U.S. company which was planning the operation of two families of small launchers and felt directly affected by the missile conversion plans of Lockheed. The difficult choice the Government faced was between permitting (unfair?) competition with the private launch industry but, in so doing, recouping part of the investments (paid for by the taxpayer) in the missiles so used, and "throwing away the assets" and not stand in the way of private industry recouping its own investments.

The U.S. Commercial Space Policy Guidelines approved by President Bush on February 12, 1991, though containing many statements which reflected a spirit of 'promote but don't interfere with the private sector', was not very helpful on this specific issue. One provision might well have been quoted by the launch industry threatened by the Poseidon venture:

"U.S. Government agencies may make available to the private sector those assets which have been determined to be excess to the requirements of the U.S. Government in accordance with U.S. law and applicable international treaty obligations. Due regard shall be given to the economic impact such transfer may have on the commercial space sector, promoting competition, and the long term public interest."[306]

305. See M. Potter, *Swords into ploughshares - Missiles as commercial launchers*, 7 (2) Space Policy 146-150 (1991) hereinafter referred to as Potter 1991, at 147.
306. See *U.S. Commercial Space Policy Guidelines*, The White House, Office of the Press Secretary (Feb 12, 1991) in Gorove, US Space Law, *supra* note 55, at 1.A.4 (a-1).

On the other hand, Lockheed could have quoted the same statement, referring to the pro-competitive language employed, to solicit support for its project.

The matter was specially addressed and clarified in Clinton's National Space Transportation Policy of 1994, which, in the spirit of a pro-commercial space transportation industry philosophy, limited the commercial use of U.S. excess ballistic missile assets with the following provisions:

"U.S. excess ballistic missile assets that will be eliminated under the START agreements shall either be retained for government use or be destroyed. These assets may be used within the U.S. Government [USG] in accordance with established DoD procedures, for any purpose except to launch payloads into orbit.
Requests from within the Department of Defense or from other [USG] agencies to use these assets for launching payloads into orbit will be considered by the DoD on a case-by-case basis and require approval by the Secretary of Defense.

Mindful of the policy's guidance that [USG] agencies shall purchase commercially available U.S. space transportation products and services to the fullest extent feasible, use of excess ballistic missile assets may be permitted for launching payloads into orbit when the following conditions are met:
(a) The payload supports the sponsoring agency's mission.
(b) The use of excess ballistic missile assets is consistent with international obligations, including the MTCR guidelines and the START agreements.
(c) The sponsoring agency must certify the use of excess ballistic missile assets results in a cost savings for the [USG] relative to the use of available commercial launch services that would also meet mission requirements, including performance, schedule, and risk."[307]

As one of the Presidential draftsmen explained to Congress,

"[t]hus engineering tests and suborbital flight experiments are allowed, but orbital flights which may compete with private sector providers would have to satisfy some tough criteria. We believe that these criteria are clear and reasonable and that they provide sufficient flexibility to protect government interests while continuing to encourage private sector investment in new space transportation systems. If converting ballistic missiles to space launch vehicles can be done in a manner that saves money to the government, this policy will still allow us to take advantage of those savings."[308]

307. See *National Space Transportation Policy*, Fact Sheet, The White House, Office of Science and Technology Policy (Aug 5, 1994). <http://www.whitehouse.gov/WH/EOP/OSTP/other/launchts.html>, hereinafter referred to as 1994 Space transportation policy.
308. See Statement of Dr. John H. Gibbons, Assistant to the President for Science and Technology, Director, Office of Science and Technology Policy on National Space Transportation Policy, before the Subcommittee on Space, House Committee on Science, Space and Technology (Sep 20, 1994).

OSC's original unhappiness with the above policy's potential for allowing competitive missiles-turned-launchers evaporated when, in 1997, it concluded a contract with USAF to convert as many as 24 Minuteman 2 missiles to launchers for government LEO launches.
The program, which is potentially worth more than USD 200 million to OSC, will turn the missiles into four-stage launchers, half Minuteman 2 half Pegasus XL. It has in the meantime been christened the Orbital-Suborbital Program (OSP) *Minotaur*, and will, in September 1999, on its first launch carry two small USAF research satellites, in conformity with the above 1994 policy. (The Air Force is reported to have about 350 sets of Minuteman engines in storage, which could be used for the program).[309]
The Minuteman/Minotaur program is so far the only example of a U.S. missile-conversion project following the adoption of the 1994 policy.
The Commercial Space Act of October 1998 (H.R. 1702), has formalized the provision of the above Policy. At the same time it created a measure of Congressional control by requiring the Federal agency, which seeks to use the excess ICBM as a space transportation vehicle, to transmit to a number of Congressional Committees a certification that the use of such missile:

"(A) would result in cost savings to the Federal Government when compared to the cost of acquiring space transportation services from United States commercial providers
(B) meets all mission requirements of the agency, including performance schedule, and risk requirements;
(C) is consistent with international obligations of the United States; and
(D) is approved by the Secretary of Defense or his designee."[310]

The legislation was presented as primarily cost-savings driven.[311]

As for the foreign missiles, although the above combination of national security, foreign policy and trade considerations made for such complicating factors as to appear to doom the above U.S.-Soviet *Start* initiative right from the beginning, the program not only survived (though without U.S.

309. See Space News Online (Sep 15, 1997) at 4 ("Minuteman deal expands Orbital;s launch capability") and Space News Online (Sep 7, 1998) at 14 ("Dod approval sought for Minuteman motors/new rocket would loft research satellite"), <http://www.spacenews.com/spacenews/members/sarch/sarch97/sno915rl.htm and .../sarch98/sno907ac.htm> respectively.
310. See Sec. 205 ("use of excess intercontinental ballistic missiles"), Commercial Space Act, *infra* Ch. 3, note 247.
311. As one of the sponsors said in a Senate Subcommittee meeting, "[this legislation] actually saves money by allowing the conversion of excess ballistic missiles into space transportation vehicles ... they are extremely expensive to store ... using these missiles as launch vehicles ... for small scientific and educational [Government] payloads ... is a legal and efficient way to dispose of an expensive asset", see statement of U.S. senator Bob Graham, "Commercial Space Act of 1997", Subcommittee on Science, Technology and Space, Senate Commerce, Science and Transportation Committee (Mar 5, 1998).

participation) with both a Start and a Start I rocket but was joined by the *Rockot* launch vehicle based on the Russian SS-19 ICBM. The latter launch vehicle is being marketed by DASA of Germany under the name *Eurockot*.[312] In February 1994, the Moscow-based Start-1 sales company *STC Complex* was reported to have concluded a launch contract with a South African state owned defense firm for the launch of its Greensat remote sensing satellite. One of the two U.S. competitors, Orbital Sciences, accused the Russian firm of engaging in predatory pricing, in violation of the U.S.-Russian launch trade agreement concluded in July 1993 (See Chapter 3.2 *infra*), but the issue became moot when the South African firm, later that year, decided to abandon this and other space projects for lack of international investors.[313]

In 1994, a START-inspired debate erupted on the subject between the U.S. and Russia and the Ukraine. The latter countries took the position that ICBM's and SLBM's used for space launch purposes were not accountable under the START I Treaty. The U.S. vigorously opposed this position which would have directly undercut the provisions of the Treaty. And in the fall of 1995 the parties, joined by Belarus and Kazachstan, recorded in a joint statement in the START Joint Compliance and Inspection Commission, that all space launch vehicles that use the first stage of an ICBM or SLBM are accountable as ICBM's and SLBM's of that type under the START I Treaty.[314]
As for the use by U.S. commercial companies of these new foreign launch services, the U.S. government took the position that it would consider requests for export licenses (for U.S. satellites to be so launched) on a case-by-case basis and would grant licenses only if they complied with the START Treaty and the MTCR Guidelines.[315] As we saw earlier, these Guidelines permit

312. See brief description of this DASA-Khrunichev joint venture in Chapter 1.2.1.
313. See Space News (Feb 28, 1994) at 8 ("Russia accused of underbidding to win Greensat launch") and (Nov 7, 1994) at 10 ("Denel derails launch of Greensat") respectively. A spokesman of the Defense firm Denel said in this connection: "It is safe to say that the space industry in South Africa has come to an end". The project to develop an indigenous space *launch* capability had already been abandoned in mid-1993 after an investment of USD 55 million, see *ibid.*
314. See ACDA Annual Report 1995, *supra* note 272, Chapter 3, at C ("Controlling missiles used as space launch vehicles"). Dennis J. Burnett and David Lihani give an other interpretation to the text of this Joint Statement Number 21, "On space launch vehicles that incorporate first stages of ICBMs or SLBMs", Geneva, Switzerland (Sep 28, 1995): "U.S. and Russia agreed that, on a case-by-case basis, the existence of a first stage of an ICBM or SLBM that is incorporated into a space launch vehicle, during maintenance, storage and transportation of the launch vehicle, and is located apart from other stages of an ICBM or SLBM, does not result in ICBMs or SLBMs of that type of missile being considered as a ballistic missile. On that basis, U.S. and Russia agreed that the Start space launch vehicle assembled from stages of the SS-25 ICBM is not a variant of the SS-25 nor a new type of ballistic missile for Treaty purposes." See *Developments in U.S. bilateral launch service agreements - an update*, XXI(3) Air & Space Law 100-104 (1996) (text to) note 9.
315. See *Policy on the use of foreign excess ballistic missiles for space launch*, Fact sheet, White House, Office of Science and Technology Policy (Sep 29, 1995).

MTCR members to support the space programs of other countries or international cooperation "... as long as such programs could not contribute to delivery systems for weapons of mass destruction."

An immediate beneficiary of the new policy was a Colorado-based company, called Earth Watch Inc., which received permission from the U.S. government to launch a commercial remote sensing satellite on a Russian Start-1 launcher.[316] Understandably, the two U.S. companies that had lobbied hard to keep these converted missiles out of the commercial market, Orbital Sciences and Lockheed Martin, were far from pleased, and expressed particular concern about the prices that would be quoted by the Russians.[317] (Though Russia, by virtue of its launch trade agreement with the U.S., was bound to observe pricing guidelines meant to prevent 'dumping' of launch services, only the more general provisions (prices should be comparable to prices for comparable 'market economy' launches) applied to low earth orbit launches, see Chapter 3.2, *infra*).

The overall effect of the 'ex-missiles', although recognized as a possible alternative on the launch market, has remained limited. Noteworthy in this connection is not so much the fact that the various controls and policies restrict the use of both U.S. and foreign missiles, but that (a) the U.S. (small) satellite manufactures and (small) launch manufacturers were pitted against each other, with the U.S. government caught in the middle, and that (b) the latter had to balance an array of diverse interests and obligations, such as national security, including non-proliferation of missiles, arms control and high technology exports, (fair) trade and foreign policy issues. It is submitted that, in view of the high priority and importance the U.S. in the early nineties attached to a reduction of Russia's (and Ukraine's) missile stockpiles and in the light of the cost involved and of the economic woes of these countries, a policy providing for case-by-case approval of foreign missile-derived launches, paid in hard currency by U.S. clients, made particular sense without dramatically affecting

316. See Space News (Oct 9, 1995) at 1 ("Converted Soviet missiles gain entry to U.S. market"). A more recent UN Report (partially) on worldwide space transportation systems development noted matter of factly: "The Subcommittee also took note of the introduction into the space transportation system of the Russian Federation of the Start and Rokot launchers that were based on converted ballistic missiles.", see Report of the Scientific and Technical Subcommittee on the work of its thirty-fifth session, UNCOPUOS, UNGA Doc. A/AC.105/697 (25 Feb 1998) at 25-26.

317. *Ibid.* A December review by this publication of the performance of the above small rocket companies in the year 1995 listed only failures: Start-1 failed in its first flight in March, destroying the Israeli, Russian and Mexican satellites on board; Orbital Sciences' Pegasus XL went out of control shortly after its launch in July and was destroyed (following the fate of its predecessor); the Lockheed Martin Launch Vehicle (LLV) for small payloads also did not survive its maidenflight in August; and in October 1995, EER System's Conestoga rocket exploded in mid air, see Space News (Dec 11, 1995) at 8. There was, as a result, certainly some room for additional small launchers, whether U.S. or Russian-built!).

the other interests concerned. The fact remains that State Department and DoD interests determined the fate of this market entry/access issue and thus interfered with the autonomous, free market development of the trade in launch services.

2.3.4 Liberalization of U.S. export controls

For the purpose of this study 'liberalization' of export controls is of relevance to the extent that the liberalizing measures, if any, resulted in *e.g.* (a) new launch companies being able to get off the ground and enter the international commercial launch market, (b) both new and incumbent launch companies gaining access to all (important) parts of that market, and (c) a reasonably level playing field making competition on price and quality possible.
The export controls discussed in the previous paragraphs can be distinguished in two main areas: *launcher/missile* controls and (high tech) *payload* controls. Roughly translated these controls address two situations: (a) a country wishes to acquire the capability to launch (weapons or civil loads) and needs foreign hardware and technology for that purpose, and (b) a country already possessing a launch industry wants to sell its service to the market of satellite manufacturers and owners/operators of satellites or satellite systems. Both candidates and their potential launch technology suppliers have, through the years, been confronted with (multi-)national regulatory barriers, which made it hard to 'just' join the ranks of the incumbents. To what extent did the various U.S. and international export control 'liberalization' measures make life easier for the above newcomers?

'Payload controls'

Through the years, the restrictions on the export of dual-use items in particular have been the subject of hot debates and challenges by the industry concerned. This is understandable.
The arms industry, or the 'military-industrial complex', has always been fully aware of the risks and uncertainties inherent in their line of trade: today's accepted customers may be the subject of tomorrow's restrictions, imposed by the Administration or by Congress due to shifts in national security and/or foreign policy priorities or threats.
It is different for the manufacturer and exporter of aircraft or personal computers, whose exports to foreign customers may be severely handicapped by the fact that, what they consider to be off-the-shelf technology, readily available in everyday commerce both at home and abroad, is also considered by the U.S Administration to be of military-strategic value for certain countries and should therefore not be exported without a license, with all the concomitant uncertainties, red tape, delays, costs and risks of loosing the contract to a foreign provider. (For example, the avionics and computer

systems aboard Airbus planes sold to the Soviet Union in the late eighties/early nineties were much more sophisticated than those found on many military jet aircraft, yet were not prohibited).[318]

The expansion of the licensing bureaucracy within State and Commerce in the 1980s brought at the same time increasing demands for a relaxing of controls and for a faster and less cumbersome processing of export license requests on the part of the 'high tech' industry. Where the national controls - at least with respect to the communist countries - had been multilateralized through CoCom, a two-step approach was needed: first the U.S. administration had to be convinced of the commercial benefits and strategic harmlessness of more relaxed controls with respect to certain (types of) dual-use goods and technologies. And thereafter these proposals would have to be endorsed by all CoCom members.
Such endorsements were in fact a less formidable barrier than it would seem, as, through the years, the U.S. Departments of State and Defense and the security/intelligence community - all involved in listing and de-listing decisions - had in general been more security conscious and control inclined than the foreign CoCom members.

The developments in the Soviet Union and the ensuing relaxation of East-West tensions in the years after 1990 gave sufficient domestic impetus and foreign support for substantial cuts in the list of CoCom controlled dual-use goods. Thus, in line with the objective to 'build higher fences around fewer items', controls were reduced in June 1990, and again, more substantially in September 1991, for sales to former East bloc countries of such items as: navigation, avionics and aircraft technology (including B-747 and 767 aircraft) and related communications equipment, aircraft propulsion systems, electronics, machine tools, computers and telecommunications, and some liquid fuel rocket engines and their technologies.[319]
But, as we saw earlier, CoCom, on the instigation of the U.S., made a distinction between the levels of sophistication allowed to the Soviet Union on the one hand and such 'democratized' countries as Poland, Hungary and Czechoslovakia on the other hand. The latter, to which the so-called 'Bikini list' (*sic!*) of only 40 restricted items applied, were allowed to buy sophisticated telecommunications equipment from the West. This was considerably superior to what the Soviet Union was permitted to acquire: the latter was allowed to upgrade its telephone network only to the level of American systems of the early 1980s.[320]

318. See IHT (Jun 17, 1991) at 9 ("CoCom red tape eases with tensions").
319. See AW/ST (Jun 10, 1991) at 73.
320. In the somewhat condescending, but, at the time, probably - materially - correct view of the US, "... what the Soviets need is plain old telephones and not a lot of bells and whistles.", Allan Wendt, head of the US delegation to CoCom, see IHT 1, 10 (May 56-26, 1991) at 10 ("CoCom cuts back barriers").

The new CoCom regulations changed a fundamental aspect of the multilateral control structure. It turned a system of a presumption of denial, meaning that high technology products could not be exported unless specifically approved or exempted by CoCom, into one which enabled the manufacturers to export anything not specifically banned by CoCom; in other words, 'if it is not listed it can be sold'. But the rules continued to apply restrictions to the transfer of technology, in other words, 'ship the goods but keep the technology'.[321]

These 1991 reductions in export restrictions freed exporters considerably. As an example, Commerce faced 70% fewer computer export applications, and the liberalization of controls represented an overall reduction of some 50% in the CoCom list of militarily significant goods and technologies. But not all was well for the parties concerned. For one thing, as observed earlier, the Gulf war taught a few lessons on the military relevance of some dual-use goods, such as night-vision devices (Iraq's Soviet technology-based capabilities turned out to be far less sophisticated than the products used by the allies) and fiber optic links (which Iraq used for military communications and the coalition forces found difficult to knock out).[322]
As a consequence, U.S. export controls on these items remained in force vis-à-vis the Soviet Union (and it would take a unanimous 'yes' from CoCom to permit any member to export such technology to that country).[323]
Business groups representing 'high tech' companies were still disappointed, particularly in the area of computers and telecommunications,[324] but had to wait until 1992 for another modest liberalization step. In that year, the State Department, concluding an exercise started two years earlier with Executive Order 12735 of November 1990, published a Final Rule transferring some 'innocent' satellites from the USML to the Commerce Control List.[325]
What had started as a "harmonization exercise" aimed at bringing *all* space items of a primarily commercial nature under Commerce jurisdiction, turned out to be a measure of such limited scope and importance to the U.S. manufacturers that a Congressional Hearing on "Export control reform in high technology" one year later became a full-fledged U.S. industry attack on the

321. See IHT 9, 14 (Jun 17, 1991) at 9.
322. See AW/ST (Jun 10, 1991) at 73.
323. The SU had expressed interest in buying a state of the art fiber-optic communications network to span their entire territory, but the NSA had argued that it is harder to listen in on a fiber optic telephone line than on traditional telephone wiring, see IHT 1, 10 (Jun 25-26, 1991) at 10.
324. "Our expectations had been raised by the rhetoric used by President Bush when he announced the core list reductions last June [1990] ... [but] we are seeing very little improvement in the last year", see *ibid.*
325. Final Rule of October 23, 1992, to amend Sec. 38 of the AECA. The rule transferred commercial communications satellites that do not have certain sensitive characteristics (under nine categories) to the export licensing control of the Commerce Dept. Military satellites and communications satellites with any of the nine categories of sensitive characteristics remained on the USML.

country's outdated, complicated, bureaucratic, costly and ineffective, if not futile, export controls.[326]
Noteworthy is that, already at that occasion, the U.S. software industry strongly criticized the export controls both on computers as such and on commercial *encryption* software (which is used to protect, 'encrypt', confidential computer data (transmission) against theft, manipulation, etc.) as unrealistic and virtually meaningless given the wide foreign availability of this technology.[327] In 1998, the issue of the protection of encryption technology had grown to become the biggest export control 'headache' of the U.S. security and intelligence community and the single most time and energy consuming export licensing issue for both the State Department and Commerce.[328]

Notwithstanding the above severe criticism on the part of the industry and intense lobbying efforts, with a leading role of Hughes Space and Communications, and supported by Commerce[329], a bill proposed in Congress in April 1994 transferring all commercial satellites from USML to CCL was defeated as a result of a determined Defense and State Department defense of the *status quo*.

In 1995, the U.S. administration improved the dual-use export control process by, *inter alia*, strengthening the role of other agencies in the review process. By Executive Order, the Departments of Defense, Energy, State and ACDA were given the right to review any license of interest to them, with, in case of dissent, each department casting a single vote and decisions taken by simple majority; moreover, enforcement of the regulations was strengthened.[330]

The demise of cold war export regulator CoCom in 1994 freed the former Communist countries of multilaterally enforced restrictions on military and dual-use goods and technologies, bringing computers, encryption and satellites (as an example of one highly valuable combination of advanced technologies

326. See High technology hearing, *supra* note 278, *passim*.
327. See *id.*, at 30 (testimony James A. Abrahamson, chairman, Oracle Corp.).
328. See *inter alia* Reinsch, Update West 98, *supra* note 262, at 3-4.
329. As Hughes Space and Communications' President Dorfman said (in 1994), "communications satellites are commercial products having nothing to do with weapons, and should be under the Commerce Department to facilitate international trade of US industry." Hughes wanted to use Chinese launch vehicles for its satellites "without having to convince skeptics in the Pentagon and the State Department that the satellites do not pose a technology proliferation hazard." And he called the Export Administration Control Act, proposed by Jane Harman, D-Calif, in April 1994, which would transfer license approval from the State Dept to the Commerce Dept for communications satellites, an "improvement ... because the approval process would be centered in a single agency and the State Dept would not use satellites as a tool to conduct foreign policy.", See 5 (18) Space News (May 94) at 30.
330. E.O. 12981 (Dec 1995), see *US/China technology transfer*, testimony of William A. Reinsch, Under secretary for export administration, Dept of Commerce, before the Joint Economic Committee (Apr 28, 1998) <http://www.bxa.doc.gov/press/98/PRCtech.html>

of relevance in the space market) in principle within reach, though henceforth depending on less predictable *national* laws, policies and practices. Since both China and Russia, once prime targets of CoCom controls, were at the same time potential launch providers restrained in the performance of that role by these controls, the end of CoCom meant the removal of *a multilateral Western-made barrier to market entry and access*.[331]
The Wassenaar Arrangement now focuses in a different way on other countries with a - so far - less effective control mechanism. None of these - possibly - targeted countries belong to the category of prospective launch providers which would be prevented from entering the market as a result of Wassenaar controls. To the extent Wassenaar discourages its parties from selling certain dual-use items, such as satellites or satellite components, to terrorist-supporting or other 'rogue' countries, all Wassenaar launch providers (and satellite manufacturers) may perceive this as effectively *limiting their market access* through the restrictions imposed on their free choice of clients.

An additional complication for the export of satellites is the increasing sophistication of the software and the concomitant need for sophisticated data (transfer) protection, *i.e.* encryption. The more sophisticated the latter, the more hesitant the U.S. security and intelligence community has been with respect to the export thereof, and the more complicated and time-consuming the accompanying licensing process has become.
Where, originally, the sale and export of encryption was seen as a national security-endangering activity (how can you listen in on international communications if the messages concerned are encrypted?) and therefore subjected to State Department controls, at the end of 1996 new Commerce regulations were published that transferred licensing of *encryption* products

331. Three years later, in testimony before the Senate Committee on governmental affairs, Subcommittee on international security, proliferation, and federal services, of Jun 11, 1997, hereinafter referred to as Reinsch testimony 1997, Commerce Under secretary for export administration Reinsch made the following statement on the Administration's post-CoCom attitude towards Russia: "Russia is continuing to develop its own export control system and is in the early stages of participating in international export control regimes. It is a member of Wassenaar ... It is a party to major non-proliferation treaties and agreements ... At the same time ... although Russian policies with respect to the development and export of weapons of mass destruction are encouraging, actual events from time to time are not consistent with those policies. Until we see greater consistency between Russian policy and practice, including a Russian export control system that is more reliable and fully harmonized with our own and that of our Wassenaar partners, we will continue to maintain appropriate controls on exports to Russia." With respect to China, the same official said: "our export control policy toward China seeks to support our engagement strategy and creation of higher -paying, export-based jobs in the U.S., while denying licenses for items whose export would pose significant national security risks to the U.S. ... we scrutinize carefully exports which might raise national security concerns. We also continue to maintain Tiananmen sanctions, which limit the items that can be licensed for China. Where appropriate we impose sanctions on Chinese entities for proliferation or other activities, consistent with U.S. laws. <http://www.bxa.doc.gov/PRESS/97/warcon10.htm >."

from the State Department' Munitions List to the Department of Commerce's dual-use list (CCL). This did not result in a substantial lessening of controls, but created a different, more industry-oriented starting point for national controls (which remain an *inter-agency* responsibility).

From 1994, on an *ad hoc* basis, a number of satellites received State Department or Commerce clearance - depending in each case on the satellite's performance characteristics - for export to China.[332] But it took until March 1996 before President Clinton, following - what is now called - a "tense Washington turf war between the State and Commerce Departments, and a broader debate over how to balance America's security concerns and commercial competition in the hottest of all the commercial markets",[333] decided that control of export licensing for communications satellites was to be transferred to Commerce. Henceforth, *all commercial communications satellites* would be controlled by Commerce even if they had embedded in them individual munitions list (USML) components or technologies.
Though at the same time national security and foreign policy controls in the Commerce regulations were tightened, this shift from State to Commerce control was hailed by the U.S. satellite manufacturing industry at the time because it de-emphasized the national security and foreign policy aspects of the sale of satellites to, and *their launch by* foreign countries.

In the meantime, in 1998, the Clinton decision has become the subject of intense - though largely partisan - Congressional criticism, in part because of the benefits it provided to the Chinese launch industry, in part because of technology transfer issues which arose in 1996, and, in large part, because of the suggestion of improper re-election campaign-related influence peddling by a combination of Chinese and U.S. satellite industry (Loral Space and Communications) interests, including sizeable donations to Democratic causes by the two parties concerned.[334]

One of the actions the House took in this connection, infuriating and frustrating the U.S. satellite industry, was the approval of legislation which prohibits exporting American-made satellites to China, a measure which would prevent China Great Wall Industry from launching any satellite built in the U.S. or any satellite that contains U.S. components for which an export license is required.[335] (The Senate fortunately did not concur with this piece of rather ill-considered legislation).

332. Part of these export licenses concerned satellites which were to be launched on Chinese Long March rockets, see Chapter 3.1.
333. See NYT 1, 18 (May 17, 1998) at 1 ("How Chinese won rights to launch satellites for U.S.").
334. See *id.*
335. See 9 (21) Space News 1, 20 (May 1998) at 1.

At a May 1998 Hearing of the Senate Governmental Affairs Subcommittee on international security, proliferation and federal services members questioned Clinton's 1996 decision to transfer the licensing of communications satellites exports to Commerce.[336] This already resulted in legislation adopted by both House and Senate, and - reluctantly - signed into law by President Clinton on October 17, 1998, to transfer this authority back to the State Department, a move with which Congress reintroduced a more emphatic national security and foreign policy imprint on satellite export licensing (see further Chapter 4).

The political uproar created by these allegations has led to the setting up of a special nine-member House Committee with far-reaching authority to look into whether U.S. national security was undermined by Clinton Administration actions by allowing the launch of U.S. satellites on Chinese Long March Rockets. The committee was given wide subpoena powers and the ability to examine tax records of people and businesses it deems relevant, dating back to 1988.[337]
That year had not been chosen at random. It is the year in which Chinese entry into the international commercial launch market through the possible launch of U.S.-built satellites became a matter of debate within and between the Administration and Congress. (The U.S.-Chinese launch trade relations will be discussed in the next Chapter).

In June 1997, a U.S. Commerce official made the following statement before a Senate Subcommittee (under the heading "Further export control liberalizations will be limited"):

"We are down now to less than 9,000 licenses annually, and, increasingly, they are limited to items that are multilaterally controlled or items that are controlled to terrorist or other

336. See *ibid.* The suggestion that national security was compromised by the Clinton decision was firmly rejected by the Director of ACDA, John Holum, in testimony before the House International Relations and National Security Committees in June 1998. As he observed, "... the further shift in control was accompanied by new control procedures and regulations to strengthen safeguards. Interagency review was strengthened, giving State and Defense the right to review all Commerce export license applications. A new foreign policy and national security control was established in Commerce's Export Administration Regulations whereby State and Defense could recommend denial of a satellite export to any destination on the basis of national security or foreign policy interests. Commercial communications satellites were made exempt from the foreign availability requirements of the [EAA]. ... it remains the judgement of the Department of State, that the changes made in the Commerce export licensing system in 1996 were sufficient to deal with the national security sensitivities associated with foreign launches of communications satellites. They provide a degree of protection for these items when under Commerce control that approximates the strict controls of the [ITAR]. Therefore, [State] was provided with reasonable assurance that U.S. national security would not be adversely affected with the jurisdictional change.", see Holum testimony 1998, *supra* note 230, at 4-5.

337. See IHT (Jun 20-21, 1998) at 3. And see Chapter 4 *infra*.

rogue states where our policy is unlikely to change in the short run. Accordingly, we are not likely to see many dramatic control list modifications in the near term. Nevertheless, we have an ongoing need to keep our controls up to date with advances in technology and spreading foreign availability. In sectors like electronics, where product life cycles are short, we need to review our policies regularly to make sure we are not continuing to control old generation items that are now widely available from other sources."[338]

Less than one year later, the same official expressed his frustration about Congressional action in 1997 which, contrary to his Department's policy (*i.e.* to focus controls on those choke-point technologies without which a weapon cannot be built and which can be controlled because of their special qualities, small number of producers, or limited alternative uses), imposed new restraints on the export of 'high performance' computers, requiring his Bureau of Export Administration (BXA) to perform post-shipment checks on U.S.-built computers sold to 50 countries. The many customers involved and the fact that these computers possessed a level of sophistication available in other exporting countries made this requirement not only "an unsustainable burden" but also one "that served no purpose".[339]
The Commerce official went as far as qualifying this Congressional intervention as "attempts ... to roll back those hard-fought improvements [made through reform, streamlining and liberalization of the export control system] and return us to a darker era."
On the issue of further liberalization of export controls, it was noted that one of the reasons why BXA licensing load was inching back up (instead of further being reduced) was the transfer of encryption licensing to Commerce. A decline of licenses to be processed was also not expected "because I see few high volume areas ready for major liberalization." The latter, it must be concluded, is both a result of earlier streamlining and liberalization activities on the one hand and a more or less stable membership of the group of terrorist supporting or 'rogue' states as referred to earlier on the other hand. Of course, the liberalization of 'payload controls' has been dealt a severe blow by the decision of Congress to treat commercial communications satellites as arms for the purpose of export controls. (The relevant Strom Thurmond Act will be discussed in Chapter 4.1.2).

Launcher/missile controls

The limited 1991 relaxation of CoCom controls included an easing of restrictions on the export of some liquid fuel rocket engines and technologies to the 'East bloc' (while retaining such controls on more modern solid fuel rocket technology). Although, apparently, the U.S. delegate did not veto this

338. See Reinsch testimony 1997, *supra* note 331, at 4.
339. See Reinsch, Update West 98, *supra* note 262, at 2.

measure, the new rules would not likely result in a new market for American exporters of such rocket engines because, notwithstanding pressure from U.S. manufacturers, the State Department did not amend the Munitions List accordingly.[340] Other CoCom members would thus be in a position to sell these engines to the Soviet Union and Eastern Europe, thus rendering the U.S. restrictions less than effective.

An important feature of the new CoCom agreement was that individual countries would continue controlling those goods and technologies which, though dropped from the CoCom list, could contribute to the development of nuclear, chemical and biological weapons and the missiles to deliver them. This provision originated from a U.S. domestic initiative to *strengthen* rather than liberalize State and Commerce controls on WMD and missile proliferation, the so-called *Enhanced Proliferation Control Initiative* (EPCI) of 1991.[341]
As we saw earlier, these expanded controls provided authority for the government (Commerce) to block exports on any dual-use goods regardless of whether such items are specifically listed on the CCL, in cases involving exports to end-uses or end-users 'of proliferation concern' or involving risks of diversion to proliferation activities. And it imposed on exporters the burden of 'knowing' these destinations or missile projects. Put differently, an exporter should apply for a license when he knows (or is informed by BXA) that the end use of an item *may* be destined for a project or activity of WMD and/or missile proliferation concern.

In 1993, the Clinton administration proposed a new policy on non-proliferation and export control, which included important provisions on U.S. exports of space launch and missile technology. The policy which was developed in consultation with the Departments of State, Commerce and Defense, proclaimed the ambitious aim of finding a balance between proliferation concerns on the one hand and commercial needs and economic benefits on the other hand, "avoiding ineffective or unduly burdensome constraints while maintaining controls essential to curbing proliferation."
The Presidential Directive in its draft version permitted U.S. companies to sell missile and launch systems on a case-by-case basis to countries that agreed to

340. See 2 (20) Space News (Jun 1991) at 16.
341. See Ch. 2.3.1.2 *supra*. The EPCI expanded controls, first published by Commerce in March 1991 and effective as an interim rule as from August 15, 1991, reflected measures called for by President Bush's December 13, 1990, decision on the EPCI and included in his E.O. 12735 of November 16, 1990 on chemical and biological weapons proliferation, see *Imposition and expansion of foreign policy controls*, 15 CFR Parts 771, 773, 776, 779, and 799, Interim rule with request for public comment, BXA Docket, Commerce, 56 FR 40494 (Aug 15, 1991) The Rule grouped the regulations relating to weapons proliferation in a newly designated part 778, Proliferation Controls. These new regulations supplemented controls exercised *inter alia* by State's ODTC under the AECA.

abide by the MTCR guidelines. This *quid-pro-quo* ("become a member and you may buy my launch technology")[342] which originated in the State Department, brought severe criticism from a Congress which did not see MTCR membership as a sufficient guarantee against misuse of the technologies bought. (And they were right in the sense that MTCR does not provide for (multilateral) inspection or other measures to ensure that peaceful launch technology is not diverted to military programs.) The main worry Congressional opponents had was that any (developing) country, by becoming a MTCR member, would be eligible for receiving launcher, and thus missile, technology, which would in fact defeat the purpose of the non-proliferation exercise. Administration officials denied that the new policy would automatically open the door to increased sales, while at the same time highlighting the benefits of the policy to the exporting industry. What they did maintain however was the principle of case-by-case appraisal of each export, which would give the Administration the desired latitude for each individual case, exactly the situation Congress tried to prevent[343]. The end result of (hurried) discussions on the matter between the administration and Congress was a new "*Non-proliferation and export control policy*", issued on September 27, 1993, which still did not quite please Congress, as it maintained a difference in treatment depending on the purpose, either military (missile) or civil (launcher), and did not limit this 'relaxation' of controls to deserving trusted allies only. The relevant text on "missile proliferation", apart from strongly supporting the MTCR and promoting the guidelines' principles as a global missile non-proliferation norm, stated:

"We will support prudent expansion of the MTCR's membership to include additional countries that subscribe to international non-proliferation standards, enforce effective export controls, and abandon offensive ballistic missile programs ...
The [U.S.] will continue to oppose missile programs of proliferation concern and will exercise particular restraint in missile-related cooperation.
We will continue to retain a strong presumption of denial against exports to any country of complete space launch vehicles or major components.
The [U.S.] will *not support* the development or acquisition of space launch vehicles in countries *outside* the MTCR.
For *MTCR member* countries, we will *not encourage* new space launch vehicle programs which raise questions on both non-proliferation and economic viability grounds.
The [U.S.] will, however, consider exports of MTCR-controlled items to MTCR member countries for peaceful space launch programs on a case-by-case basis.

342. The idea was to induce all those countries to become MTCR member which already possessed a level of launcher or missile technology and were therefore potential exporters of that technology to 'rogue' countries known or suspected to have offensive missile programs: in that connection Russia, Brazil, South Africa, India and Israel were mentioned as possible candidates for this membership drive, see 4 (37) Space News (Sep 1993), at 4 ("Gore to mediate missile dispute").
343. See *ibid.*

We will review whether additional constraints or safeguards could reduce the risk of misuse of space launch technology. We will seek adoption by all MTCR partners of policies as vigilant as our own." (emph. add.).[344]

The emphasized safeguard clause was added by the White House following the above discussions with members of Congress. Statements made in the House after the release of the policy showed that this measure alone did not allay Congressional fears of missile proliferation through exports to developing countries. An amendment approved by the House called for the U.S. government to consider export of space launch vehicle technology identical to ballistic missile technology exports, and therefore subject to the same stringent export restrictions.[345]

On the subject of export controls in general, the policy confirmed that "[t]o be truly effective, export controls should be applied uniformly by all suppliers. The United States will harmonize domestic and multilateral controls to the greatest extent possible." But, on the other hand, the policy recognized that "... the need to lead the international community or overriding national security or foreign policy interests may justify unilateral export controls in specific cases."

Disappointed exporters could find some comfort in the promise of the President "to review our unilateral dual-use export controls and policies and eliminate them unless such controls are *essential* to national security and foreign policy interests" and in the plan to streamline the implementation of the controls and to make the system more responsive and efficient "and not inhibit legitimate exports that play a key role in American economic strength, while preventing exports that would make a *material* contribution to the proliferation of weapons of mass destruction and the missiles that deliver them." (emph. add.)

The emphasized words would appear to place the burden of proof (that a product or service must remain on either the Munitions List or the Commodity Control List) on the government and, if so interpreted, would mean a significant victory for the U.S high technology product exporters. However, as we saw above, the period immediately after September 1993 did not see any substantial relaxation of dual-use controls.

344. See 1993 non-proliferation policy, *supra* note 295, at 677.

345. See 4 (39) Space News 4, 20 (Oct 1993) at 20 ("Launcher export policy changes draw opposition") The sponsor of that legislation and principal opponent to "the misguided efforts of some State Dept officials to have ... Clinton loosen existing missile and nuclear non-proliferation controls", recalled that earlier (1989) State Dept suggestions to aid emerging international space launch programs had led to the missile technology control provisions that were ultimately adopted as part of the 1991 Defense Authorization Act, requiring the [US] to treat exports of space launch vehicle technology as restrictively as those relating to ballistic missiles. But "[a]pparently, the State Dept did not get the message.", see 4 (40) Space News (Oct 1993) at 18 ("Maintain missile proliferation policy").

Finally, the policy promised to "intensify efforts to ensure that the former Soviet Union, Eastern Europe, and China do not contribute to the spread of weapons of mass destruction and missiles."
In an address to the 48th session of the U.N General Assembly on the date of the policy's release, President Clinton proposed new steps to thwart the proliferation of ballistic missiles. And "... working with Russia, Argentina, Hungary and South Africa, we have made significant progress toward that goal."[346]
As we saw earlier, these countries soon became adherents to MTCR, and at least one, Russia, demanded substantial space trade concessions in return.

The above controls mainly addressed the *supply*-side of the U.S.' missile non-proliferation effort.

The *demand*-side is a much longer and more complicated path, which the U.S. nevertheless has been following as the logical complement to the above approach. Consequently, the Policy announced that the U.S. "will also promote regional efforts to reduce the demand for missile capabilities", and singled out regions of tension such as the Korean Peninsula, the Middle East and South Asia for efforts to "address the underlying motivations for weapons acquisition and to promote regional confidence-building steps." The latter region was the target of a particularly ambitious goal:

"... we will encourage India and Pakistan to proceed with multilateral discussions of non-proliferation and security issues, with the goal of capping and eventually rolling back their nuclear and missile capabilities."

The May 1998 nuclear tests performed by India and immediately reciprocated by Pakistan dealt a heavy blow to the U.S. ambitions in this respect[347] and in fact refocused attention in the region on the nuclear option and thus also on

346. See Address by the President to the 48th Session of the [UNGA], White House Press Release (Sep 27, 1993) The White House Virtual Library <http://library.whitehouse.gov/cgi>.

347. In a commentary on the tests, Zbigniew Brzezinski, former national security adviser to President Carter, attributed this failure of US non-proliferation policy to two causes: first, the US policy since 1945 was in fact an active, though selective and in fact opportunistic, proliferation policy, aimed at assisting friends and allies, such as the UK, France and Israel, to get nuclear capabilities, and discouraging all others. So why shouldn't China and Russia do likewise with their friends and allies like Pakistan and Iran? Secondly, an effective non-proliferation policy is only possible if countries which adhere to the Nuclear Non-proliferation Treaty and abstain from the nuclear option, will not fall victim to agressive neighbours which possess such WMD. In other words, the US would have to give guarantees for the protection of the 'unarmed' against (nuclear) agression. (Of course, Brzezinski admits that Congress would never agree to such a blanket guarantee), see de Volkskrant (May 19, 1998) at 9.

the corresponding need for missile capabilities (thus frustrating the administration's demand-side approach).

At the same time, the Indian and Pakistani tests brought swift U.S. sanctions in the form of restrictions on the export of, *inter alia*, defense articles and services on the USML. The legal basis for these sanctions was the Glenn Amendment to the Arms Export Control Act, which requires the U.S. President to impose an array of sanctions on a so-called "non-nuclear state" (*i.e.* a state which does not belong to the official club of nuclear 'haves'), which explodes nuclear devices. These sanctions include the termination of all sales to India and Pakistan of any defense articles and services and of all licenses for the export to that country of any item on the USML.[348]
As far as India is concerned, the State Department consequently revoked all export licenses and technical assistance agreements, involving that country, dating back to 1994,[349] representing a value of several hundred million US dollars (not counting the value of possible Commerce sanctions).
(For instance, the ban was expected to block the export to India of Loral Space and Communications' Globalstar ground station equipment and other space-related goods and services, also affecting cooperative projects such as U.S.' use of Indian environmental satellites.)

Obviously. India and Pakistan are being hurt by these sanctions. But it is equally clear that the U.S. interests are also affected. First, this failure of its non-proliferation policy may have serious destabilizing and proliferatory consequences in the region, with countries like Pakistan, Iran and China prodded into renewed interest in and more investment into nuclear and other arms, including missiles. Secondly, the sanctions undermine the U.S. aerospace industry's reliability as a contract partner and encourages (potential) clients to seek alternative, more reliable foreign suppliers of the aerospace goods and services they require. As such, it is another example of the pitfalls of legislated unilateral export sanctions. As a Commerce official stated a few months before the nuclear tests took place:

"Increasingly ... we think of [sanctions] as a first resort, rather than as a last resort. More than many other issues, however, the sanctions devil is in the details. Badly implemented, these measures can cause enormous uncertainty and difficulty for businesses - even for those who do not trade with these [sanctioned] countries and have no intention of doing so. Careful implementation will minimize the extraterritorial impact that so irritates our allies. The Administration is working to develop a healthier sanctions policy. The one lesson we've all learned is that unilateral sanctions almost never work - support and agreement for

348. See U.S.C. Title 22, Sec. 2799aa-1 (b), "Prohibition on assistance to countries involved in transfer or use of nuclear explosive devices ...".
349. See 9 (20) Space News (May 1998) at 1, 35.

sanctions among the international community is paramount to reaching a successful result."[350]

The above 1993 missile proliferation controls made it very hard for non-MTCR member countries to acquire any missile or launch technology from the U.S. for either military or civil purposes. For member states however, the opening was there, though subject to the conditions as outlined above. One of the few 'lucky' countries was Brazil, which saw its new-found status as an MTCR member in October 1995 as its ticket to becoming a space-faring nation with an indigenous launch capability and an international - Equator based - commercial spaceport. Its membership would, in its view, allow it to purchase from other MTCR signatories key foreign technologies needed to build launch vehicles.[351]
Though neither the Regime nor national legislations provided an automatic and guaranteed access to the desired technology, the assured civil character of Brazil's plans (whatever their economic viability), the country's MTCR-adjusted export control laws and its status as a political ally of the U.S. and other Western states, made arrangements to that effect a distinct possibility.

With respect to missiles and launchers, Clinton's 1996 National Space Policy basically repeated the same approach as the above 1993 policy, by:
- opposing missile programs of proliferation concern,
- retaining a strong presumption of denial against exports of complete space launch vehicles or other MTCR Category I components,
- not supporting the development or acquisition of space launch vehicle systems in non-MTCR states, and, for MTCR countries,
- not "encouraging" new space launch vehicle programs "which raise questions from a proliferation and economic standpoint", while at the same time
- considering exports of MTCR-controlled items to MTCR countries subject to additional safeguard measures where appropriate.[352]

Though there may be small differences in emphasis between the above 1993 and 1996 policies and related practices, neither the national controls nor MTCR have been liberalized to any appreciable extent. On the contrary, the widely held concerns about WMD and missile proliferation, renewed by the Gulf war and, more recently, by the nuclear tests on the Indian subcontinent have resulted in a sharp awareness of the potential risks of a further spreading of launcher technology.

350. See Reinsch, Update West 98, *supra* note 262, at 6-7.
351. See Space News (Oct 1995) at 1 ("Brazil relishes freedom as MTCR member").
352. See National Space Policy, Intersector guidelines, (4) *Non-proliferation, export controls, and technology transfers*, Fact Sheet, The White House, National Science and Technology Council (Sep 19, 1996) <http://www.pub.whitehouse.gov/uri-res/12R?urn: pdi://oma.eop.gov.us/1996/9/20/1.text./> hereinafter referred to as Clinton space policy.

In general, therefore, new space launch programs, whether in MTCR or non-MTCR member countries, have little chance of getting any substantial support from the U.S. and from the other MTCR members (although the latter may in some cases, that is, vis-à-vis some applicants, have fewer qualms about selling launcher technology than the U.S.).
Thus, non-member applicant countries with a *missile* program face in principle considerable problems convincing an MTCR supplier of launch technology that the technology is destined for a purely civil launch program, the more so where the poor economic prospects of an indigenous launch industry will raise foreign eyebrows as such and will also raise proliferation worries. If the new program is a commercial failure, the technology may still be used to strengthen the indigenous missile program or, worse, may be sold to third parties with missile development aspirations.
And even non-members with a nascent or existing *civil* space launch program will find little encouragement, for basically the same reasons.
So the solution is to become a member of MTCR? There is no doubt that the thresholds to launch technology are lower among members, subject to certain safeguards and conditions.
But MTCR is meant to prevent the proliferation of missile/launcher technology, and targets particularly those countries which are known, suspected or potential missile 'proliferators'. In that connection it would appear to be a higher priority for the members to woo China or North Korea than to aim for *e.g.* Brazil. (And, of course, countries which do not posses such technology or whose technology is not sufficiently sophisticated to warrant restrictions on its export to third countries, are not suitable candidates for membership at all)

The U.S., as we saw earlier, has applied a 'carrot and stick' approach to those countries whose potential exports it considered potentially proliferatory. Russia's membership of MTCR was 'bought' with considerable concessions in the field of space trade, including participation by Russia in the space station program and limited access to the international launch trade market. The *quid-pro-quo* was clear: Russia would loose the revenues derived from the export of missiles but would be compensated by substantial civil space technology sales to particularly the U.S.
The same approach is being used vis-à-vis the U.S.'s prime candidate for membership, China.
In 1994, China agreed to follow the principles of MTCR, although it continued sales of missile components and technology to Iran and Pakistan, creating concerns on the part of the MTCR members about China's interpretation of the guidelines and a sense of urgency concerning China's full MTCR membership.
Where in the field of export of nuclear or dual-use commodities, China's adherence to stricter non-proliferation commitments was rewarded with nuclear cooperation programs with the U.S., the latter also promises to increase cooperation in the space launch field, in the form of more or speeded-up licenses for the export of U.S. satellites to China (for launch by the Chinese)

in return for strengthened Chinese controls on the export of missile technology.[353]
(The threat of) sanctions in case of missile-related sales violating the principles of MTCR and the above positive incentives are some of the tools used by the U.S. to get China, which is considered both part of the proliferation problem and at the same time indispensable to any effective nonproliferation policy, to fully adhere to the MTCR guidelines and, preferably, to become full member of the MTCR group.

Notwithstanding the fact that among MTCR members further development of launch capabilities are not encouraged, the combination of increased membership and the - admittedly modest - 'loophole' of peaceful space cooperation ("The [MTCR] Guidelines are not designed to impede national space programs or international cooperation in such programs as long as such programs could not contribute to delivery systems for weapons of mass destruction.") which would permit cooperation in the launch field and, finally, political pressure from 'allies' within MTCR insisting on their place under the (launching) sun - see Brazil -, has created a large group of 'insiders' with some - modest - prospects of increased launcher (and, potentially, missile) knowledge and a number of 'outsiders', non-members which are not supposed to receive any launcher/missile technology assistance at all, either because they sell missiles (proliferators) or because they buy missiles and are considered a (regional) security hazard.
The effectiveness of MTCR, dependent as it is on strict controls of all of its members, may be threatened by its very success. Do *all* members give the same interpretation to, and (continue to) faithfully comply with, the export guidelines vis-a-vis non-members? And do they all apply common principles toward the other members?

The number of countries with a civil launch capability has remained very small. New viable *commercial* operators which could threaten the oligopoly of the incumbents in the international launch market have not materialized. A number of countries have been discouraged either by the national and multilateral missile and launcher export controls or the poor economic prospects or incentives of various kinds or by any combination thereof and have decided to forego the development of an indigenous launch industry. Only some countries with other than purely commercial reasons retained this ambition. Within MTCR, Brazil is one of these. Outside MTCR, *India* would appear to be the only country with a sufficiently strong strategic 'independent-access-to-space' drive (on top of its military missiles programs) and the expertise and technology-base to turn a non-MTCR supported development of its own launch capability into a reality. But both U.S. missile controls and

353. See Holum briefing, *supra* note 189; also Holum testimony 1998, *supra* note 230.

MTCR have, up till the present time, certainly slowed down the process, and will continue to discourage other countries to follow India's example.
The strengthened export controls and increased national security awareness brought about by the 'China affair' and the resulting Strom Thurmond legislation (see Chapter 4.1.2) will only reinforce the U.S. government's resolve to oppose all programs which *could* contribute to missile development.