

**COMMERCIAL
SPACE
INSURANCE**



The space insurance aspect of the Intelsat 708 launch failure focuses on the exchange of controlled technical information within the insurance community. Insurance underwriters and reinsurers for the Apstar 1A satellite program — the next scheduled satellite to be launched on the Long March 3B after the Intelsat 708 failure — were concerned about the reliability of the Long March rocket, and the fate of future launch insurance programs in the PRC.

Immediately after the Intelsat 708 launch failure, space insurance underwriters for the Apstar 1A insurance program pressured the PRC to create an international and Independent Review Committee (IRC). These underwriters and reinsurers insisted on this arrangement to ensure that an adequate assessment of the risks of future Long March rocket launches was made.

Representatives from J & H Marsh & McLennan, an international space insurance brokerage firm, were adamant about obtaining a report from the Independent Review Committee for the benefit of the reinsurers of the Apstar 1A satellite insurance program. Members of the space insurance community were invited to attend a meeting on April 15 and 16, 1996, in the PRC. The purpose of the meeting was to build confidence in the Long March rocket, and to discuss the status of the Apstar 1A insurance program.

The space insurance acquisition and underwriting process includes the dissemination of technical information, the consideration of market conditions, capacity, and participants, and the involvement of insurance brokers, underwriters, and reinsurers. This chapter identifies several issues relating to procedures for the disclosure and handling of sensitive information by the insurance community.

It is unclear whether, or to what extent, the transmission of controlled technical information to and from the space insurance industry is reviewed in advance or monitored by U.S. Government officials.





THE ROLE OF COMMERCIAL SPACE INSURANCE IN TECHNOLOGY TRANSFER TO THE PRC

Insurance Aspects of the Long March 3B-Loral-Intelsat 708 Failure

The Intelsat 708 satellite was destroyed in a Long March 3B crash on February 15, 1996.¹ It was the second in a series of nine Intelsat satellites for which International Space Brokers was the sole insurance broker.²

Intelsat had arranged for the People's Republic of China (PRC) to launch three of the nine satellites (Intelsat 707-9, Intelsat 708, and Intelsat 801-6) on the PRC's Long March 3B rocket.³

The Intelsat satellite 708 was insured for \$204.7 million.⁴

Intelsat obtained space insurance for the launch phase only. The launch phase extended from intentional ignition of the rocket to separation of the satellite from the rocket.⁵ Under the terms of the policy, risk transferred from the pre-launch insurers for the manufacturer of the satellite, Space Systems/Loral (Loral), to Intelsat's insurers at the intentional ignition of the Long March 3B rocket carrying Intelsat 708.⁶

There were approximately 15 to 20 insurance underwriters and many reinsurers for the package that included the Intelsat 708 satellite.⁷ The lead underwriters were Marham Space Consortium⁸ and Munich Re of Munich, Germany.





**Following the
February 1996
crash of the Long
March 3B rocket
carrying an
American satellite,
the space insurance
industry made the
formation of an
independent
review committee,
which ultimately
circumvented U.S.
export policy, a
requirement for
insuring the next
launch in the PRC.**



Liz Lynch

Intelsat, an international satellite communications consortium headquartered in Washington D.C., had arranged to launch three of its nine series 700 satellites in the People's Republic of China. After its 708 satellite was destroyed during launch aboard a PRC Long March 3B rocket that crashed seconds after lift-off, Intelsat cancelled its contract with the PRC. The remaining two launches were reassigned to French Ariane rockets.

Other insurance underwriters who participated in the coverage of the Intelsat 708 satellite were:

- **U.S. Aviation Insurance Group**
- **AXA Reinsurance Company**
- **La Reunion Spatiale**
- **AGF Reassurances**
- **Reliance Assurances**
- **The Sumitomo Marine & Fire Insurance Company, Ltd.**
- **Great Lakes⁹**

The Intelsat 700 Series satellite insurance package was negotiated approximately six months prior to the first launch, when a data package including technical information on the Long March 3B was submitted to the underwriters.

After the launch of the Long March 3B rocket carrying the Intelsat 708, Intelsat reassigned the remaining two launches that had been slated for the PRC's Long March 3B to French Ariane rockets.¹⁰

Intelsat documents indicate that the decision to procure launch services from the China Great Wall Industry Corporation was based on the size of the Intelsat 708 satellite and the fact that the price was significantly below that of an Ariane launch. Intelsat documents revealed:

At issue are the agreements regarding commercial satellite launches negotiated by the PRC and the U.S. in January 1989 which deal with trade issues and market entry, technology safeguards, and liability.



Prior to the first launch of an Intelsat satellite on the maiden launch of the Long March 3B rocket, a data package was submitted to underwriters because it was considered a developmental successor to the Long March 3A (above).



Under these agreements introductory or promotional prices are allowed for the first or, in extraordinary circumstances, the second successful commercial launch of a new launch vehicle.¹¹

A Loral program manager was on-site at Intelsat during the Intelsat 708 project, and an Intelsat program manager was on-site at Loral. Intelsat insurance issues with Loral were coordinated through a Loral office located at Intelsat.¹²

Prior to the first launch of an Intelsat satellite on a PRC rocket, Intelsat requested that its broker submit a data package on the Long March 3B to underwriters because it was a developmental rocket.

The data package for the Intelsat 708 launch included a relatively large quantity of data on the Long March 3B, because of the rocket's then-recent developmental status.¹³

Michael Hewins, then Chairman of the Space and Telecom Group for J & H Marsh & McLennan,¹⁴ says that both his firm and Asia Pacific Telecommunications Satellite Co., Ltd. were interested in the reliability of the Long March after the Long March 3B-Intelsat 708 failure. Hewins says that Professor Bao Miaoqin, Chief Engineer at the PRC-controlled Asia Pacific Telecommunications Satellite Co., was told by his superiors to use the Long March for the upcoming Apstar 1A launch, but Hewins does not have any specific information about this request.¹⁵



J & H Marsh & McLennan were the insurance brokers for the next PRC launch of a Long March rocket following the 1996 crash of the Long March 3B carrying Intelsat 708. That next launch, of a Long March 3, was scheduled to carry the Hughes-built Apstar 1A satellite for a PRC-controlled consortium.

China Great Wall Industry Corporation provided the requested data in order to demonstrate that the Long March 3B's development was complete. Intelsat used China Great Wall Industry Corporation's data in its presentation to underwriters. The data covered both the Long March 3B and the PRC launch facility.¹⁶



Terry Edwards, Manager of Intelsat's Launch Vehicle Programs Office, supervised the Intelsat 708 assessment team, and interacted with Intelsat's insurance brokers. For its part, Loral provided data directly to China Great Wall Industry Corporation on the satellite-rocket interface, while Intelsat instructed Loral to take all steps necessary to demonstrate a proper interface.

Intelsat officials say that Intelsat was aware of export control requirements and complied with them, and that the Defense Technology Security Administration monitored technical meetings among the satellite owners, rocket owners, satellite manufacturers, and insurance representatives.¹⁷

Intelsat's business considerations were the basis for the cancellation of the two scheduled PRC launches following the February 15, 1996 Long March 3B crash.¹⁸ Intelsat documents stated that:

There is an unreasonable and unacceptably high technical and safety risk in proceeding with additional [Long March 3B] launches of Intelsat spacecraft until [China Great Wall Industry Corporation] has accomplished a sufficient number of successful operational launches of the vehicle demonstrating a reliability equal to other major providers of launch services to Intelsat.”¹⁹

Intelsat has not used a PRC rocket since the failure of the Long March 3B carrying Intelsat 708.

According to Mark Quinn, former Vice President at J & H Marsh & McLennan, there were no J & H employees on-site in the PRC for the Long March 3B-Intelsat 708 failure. Quinn says he does not recall any specific discussions, and says he did not have any conversations with underwriters or reinsurers regarding that failure. Nor did Quinn discuss specific issues regarding insurability for that program with anyone. Quinn says that he contacted his clients regarding the Long March 3B-Intelsat 708 failure and also called contacts at Loral. Quinn does not recall the content of the calls, other than to ask whether market conditions had changed.²⁰



The Treasurer of Intelsat, Randall Bonney, has primary contact with Intelsat's insurance brokers for insurance-related issues. Bonney is responsible for submitting the Notice of Loss to the insurance companies in the case of a failure, and he prepared the Summary Report of Loss for Intelsat 708. Intelsat's Launch Vehicle Program Office is the insurer's point of contact for technical information. Most launch service questions from insurance underwriters come through this office at Intelsat, but some may not have done so.²¹

J & H Marsh & McLennan's Hewins, then Chairman of the firm's Space and Telecom Group, recalls that Loral President Bernard Schwartz projected a broad intent to "get it right" regarding satellite launches in the PRC. However, Hewins says he had no specific discussions of the subject with Schwartz.²²

The Formation of the Independent Review Committee

The launch failure of the Long March 3B rocket carrying the Loral-manufactured Intelsat 708 satellite occurred on February 15, 1996. Immediately, the French space insurance underwriters for the upcoming Apstar-1A launch pressured the launch service provider, China Great Wall Industry Corporation, through their insurance broker, J & H Marsh & McLennan, to create an Independent Review Committee. China Great Wall Industry Corporation was about to launch the Hughes-made Apstar-1A satellite for the PRC-controlled Asia Pacific Telecommunications Satellite Co. aboard a Long March rocket.

On February 21, 1996, Paul O'Connor, then Vice President of the Space and Telecom Group of J & H Marsh & McLennan in Washington, D.C., wrote China Great Wall Industry Corporation recommending that "CGWIC should implement an immediate and aggressive public relations (PR) campaign with space insurance underwriters" by way of a technical briefing on the Intelsat 708 mission failure.²³

O'Connor's letter stressed the importance of quick and decisive action by China Great Wall Industry Corporation. Lost confidence on the part of the PRC's customers, he said, could cost tens of millions of dollars in business. "The space insurance underwriters should see that China Great Wall Industry Corporation is serious about getting its message out to the international community and is prepared to act quickly and with determination, rather than react to customer requests."²⁴



Jacques Masson, then Manager of J & H Marsh & McLennan's Paris office, discussed the Intelsat 708 failure with the French insurance industry, specifically the underwriter La Reunion Spatiale. As Masson explained in a February 22, 1996, e-mail:

We should strongly recommend to implement an independent inquiry board. As far as I know from various information release [sic], Chinese have formed three committee[s]: oversight committee, investigation committee, and the failure investigation and analysis group.

All of them are strongly linked to Chinese industry.

The message that we shall send them, is that their credibility is at stake and without any international independent inquiry board we don't give them much chance of success. Everyone I discussed with are very strong on that point. This is the way that Arianespace is doing each time.

I will send you by separate mail some input from previous Ariane failure inquiry board[s]. This information is confidential, however. [S]chedule quick very quick help to form it.²⁵

The underwriters for the Apstar-1A program became disappointed that the PRC's failure review committees did not have foreign or Intelsat representatives.²⁶ The French launch vehicle provider Arianespace, for example, typically creates an independent review committee after a launch failure to ensure international credibility and distance Arianespace from the review process. "This is interpreted by Westerners as CALT [the China Academy of Launch Vehicle Technology] wanting to 'hide' the results of the failure review and avoid independent international scrutiny," the underwriters said.²⁷

J & H Marsh McLennan's O'Connor advised the PRC representatives that a typical schedule of an independent review committee for an Ariane failure would entail assessing the mission and setting up the review committee within the first week. Approximately two weeks later, a report of the committee's findings would be provided to Arianespace and the European Space Agency. Lastly, the committee would



provide a briefing to customers and insurance underwriters regarding the failure investigation. Detailed information releases to relevant parties would follow.²⁸

O'Connor praised China Great Wall Industry Corporation for its general dissemination of information relating to the failure to its customers and other parties. He also stressed, however, the importance of allowing J & H Marsh & McLennan to distribute information releases to the insurance underwriters on behalf of China Great Wall Industry Corporation. This step would, he urged, ensure that there is no delay in the release of information.²⁹

O'Connor outlined specific items that must be satisfied for reinsurers to continue to underwrite the Apstar-1A program. The reinsurers must:

- *“Receive fully detailed information concerning the very root cause(s) of the [Intelsat 708] mission failure and the solutions”*
- *“Receive the advice of an independent organization concerning the analysis of the failure, and the solutions set forth by China Great Wall Industry Corporation ”*

The reinsurers, O'Connor explained, believed that Intelsat should be considered to fill the role of an independent organization. China Great Wall Industry Corporation and the China Academy of Launch Vehicle Technology continued to receive, O'Connor noted, “strong international criticism . . . for failing to have an international, independent failure review team.”³⁰

O'Connor advised China Great Wall Industry Corporation that reinsurers had stated that the Apstar-1A program would not proceed until these concerns were satisfied.³¹ On March 8, 1996, European underwriter Reliance Assurances stated to O'Connor: “We firmly believe that such a determination, together with an explanation of and concurrence with the appropriate corrective measures, is necessary to undertake an objective analysis of the insurance risk as it exists at this point in time.”³²



On March 11, 1996, Henry Stackpole, III, of Loral in Tokyo wrote that “SS/L [Loral] has . . . offered ‘in house’ assistance if desired in the investigation but doubt seriously it would be accepted. We appear to be clear of any Chinese thought that the satellite was a causal factor.”³³

A presentation at the Apstar-1A program insurance meeting was scheduled for March 14 and 15, 1996, in Beijing and included insurance market requirements. Attendees included:

- **Representatives from 11 reinsurers**
- **J & H Marsh & McLennan**
- **China Great Wall Industry Corporation**

According to J & H Marsh & McLennan presentation materials, requirements included an open and thorough investigation and an independent committee consisting of well-recognized industrial people.³⁴

The French underwriting community identified three specific issues as the minimum necessary to raise the level of confidence sufficiently to insure future launches of the Long March 3B. The requirements were to reassess China Great Wall Industry Corporation’s qualification, acceptance, and quality assurance programs, and to conduct a demonstration flight of the Long March 3B. “It seems obvious to the underwriters that the next Long March 3B launch is not insurable.”³⁵

On March 20, 1996, J & H Marsh & McLennan’s Masson wrote Professor Bao Miaoqin, chief engineer of the PRC-controlled Asia Pacific Telecommunications Satellite Co. whose Hughes-manufactured Apstar 1A satellite was the next scheduled launch of a Long March rocket (the Long March 3):

The Underwriters do not believe that the limitation of the IRC [Independent Review Committee] to one body constitutes a problem. The SS/L [Loral] capability and expertise in the field of launch vehicles [rockets] constitute[s] an issue, however.

The integrity of Loral and its expertise in the satellite system and launch vehicle interface design is well recognized, but the



lack of clear and recognized launch vehicle expertise will put in question the validity of Loral's conclusions, however. This limitation constitutes a problem for the French Underwriters.

In [sic] the other hand, Tim Wright has questioned other European Underwriters. The reaction he got from the leader Munich Re is opposite to the French position. This limitation is acceptable providing that the expertise of each member of the Loral team is clearly identified.

We have now three Underwriters with a negative position against one Underwriter. To solve this problem, we have investigated with the French Underwriters if there is other option.

The ideal option for these Underwriters is to have an IRC that is formed by individual people who have an expertise in the launch vehicle system well recognized by the space industry.

This type of committee set up is ideal for Underwriters because it insures the expertise of the IRC and its independence. It should be noted that all independent failure reviews for western launch vehicles are constituted with individual people and not by company or organization as Intelsat.

Ideally the committee should be formed with four people, two from Europe and two from USA. The member[s] should not have an active position in the space industry but should be retired senior members. Their expertise should be recognized by the space industry and space insurance leaders

We recommend to create the IRC with Loral people and try in parallel to add two or three individual members to the IRC. In this condition, if we are not able to add more members we will have a lowest requirement satisfy [sic] for the meeting. However, if we succeed to add the individual members, we will constitute a perfect IRC.



If a decision is taken to follow this recommendation, we can quickly set up and submit a list of individuals who could be approached to become a member of the IRC. We have already identified some individuals in France who are potential members. The reason we are limiting our list to French experts, is that France is the leader in the Ariane program with more than 60%. Most of the experts in launch system are in France.

In order to succeed, it is very important that we react very quickly. The IRC should be formed in 2 or 3 days, no more. We can offer a full support here in Paris to help to identify and approach the selected individuals if it becomes necessary.

After having setup the IRC, we will need to define the mission of the IRC and prepare an action plan so that the IRC could formulate a conclusion for the meeting in Beijing.

We think necessary that the IRC shall gather in Beijing for one week to assess the work performed by the different failure review boards.

One important key to the success of the IRC, is the full access to the information and data.³⁶

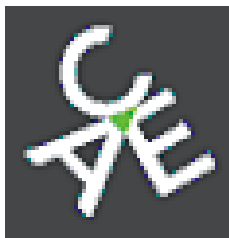
On March 20, 1996, and in a subsequent message dated March 21, 1996, to the PRC-controlled Asia Pacific Telecommunications Satellite Co., Masson identified three potential members of the Independent Review Committee: one each from Aerospatiale, Matra Marconi, and Arianespace. Each was an expert in rocket operations and in conducting in-depth failure reviews, and was retired from the private space industry.

None of the individuals had been contacted, however, pending the proper authorization from China Great Wall Industry Corporation and the China Academy of Launch Vehicle Technology. Messr. Bignier, a leading figure in the French and European space industry and a consultant to La Reunion Spatiale who had visited the PRC twice and was familiar with the PRC space industry and “the difficult position



where are CGWIC and CALT today,” had also been contacted and asked to support the creation of the Independent Review Committee.³⁷

On March 21, 1996, Chuck Rudd, Senior Vice President of ACE Limited, a Bermuda-based underwriter, wrote Sheila Nicoll at J & H Marsch & McLennan that ACE had been informed (by an unidentified source) that Intelsat would provide technical expertise and familiarity with China Great Wall Industry Corporation to the Independent Review Committee. Intelsat, he said, “provides a level of comfort that the failure investigation will be complete and unbiased.”³⁸



ACE Limited, a Bermuda-based space insurance underwriter, pulled out of the Apstar 1A insurance contract due to China Great Wall Industry Corporation’s “unacceptable” response to the Long March 2E crash.

On the same day, ACE Limited officially advised J & H Marsh & McLennan that “the launch failure of the Long March 3B [constitutes] a material increase in the risk of loss under the Apstar 1A launch policy.” ACE Limited stated that it found the actions of both the customer for the planned Apstar 1A launch, the PRC-controlled Asia Pacific Telecommunications Satellite Co., and the launch services provider, China Great Wall Industry Corporation, to be unacceptable:

The rushed invitation to attend the failure briefing confirmed to us that CGWIC [China Great Wall Industry Corporation] is not pursuing proper due diligence following a loss.

Consequently, we firmly believe that concurrence by Intelsat of the cause and correction of the failure is paramount.

In the event the information is incomplete and/or not fully [reviewed] by an independent party, ACE Limited will have no alternative but to cancel its participation [in the Apstar 1A syndicate].³⁹

Toward the end of March 1996, Intelsat declined to participate in the failure review. One J & H Marsh & McLennan official thought the decision was consistent with Intelsat’s cancellation, after the Long March 3B-Intelsat 708 failure, of

future Intelsat launches on PRC rockets until 2000.⁴⁰

J & H Marsh & McLennan's O'Connor wrote Professor Bao Miaoqin of the PRC-controlled Asia Pacific Telecommunications Satellite Co. that:

The reinsurers have stated that the IOC's [International Oversight Committee, i.e., the IRC] review of the failure investigation is a mandatory item to be implemented before the technical briefing.

Reinsurers are asking what is the status of Intelsat in the IOC. J & H has to provide reinsurers with a firm and final explanation, tomorrow, Tuesday, April 2 so we can ask APT to coordinate a response through CGWIC [China Great Wall Industry Corporation] . . .⁴¹

There is no doubt about the launch agency's capability to meet the deadlines for the preparation of materials and formation of an independent international oversight committee but APT is lock and load on going ahead at this time due to absolutely strict project and financial timelines. APT has zero tolerance to further delays.⁴²

The following day, April 2, 1996, O'Connor again wrote Professor Bao Miaoqin:

IOC – we have received further inquiries from reinsurers today about the status and membership of one IOC. To date, we have not received any notification from CGWIC [China Great Wall Industry Corporation] on this matter and wish to remind the parties of the serious nature of this matter.

We have not been authorized by CGWIC to approach the European candidates for the IOC membership. This matter must be settled as a matter of urgency – it cannot be delayed until April 9.⁴³

On the same day, April 2, 1996, Professor Bao Miaoqin wrote J & H Marsh & McLennan and China Great Wall Industry Corporation asking for a list of the Apstar-



1A reinsurers and Independent Review Committee members by April 9, 1996.⁴⁴

According to J & H Marsh & McLennan's Masson, who wrote his colleague O'Connor on April 3, the underwriting community wanted "minimum conditions to be satisfied" in order to confirm insurance commitments with respect to the upcoming Apstar-1A. Masson wrote to O'Connor:

The UWs [underwriters] will be very critical in their assessment for two reasons:

- a) The previous failures of the [Long March 2E rocket] didn't leave a good souvenir [sic] in the UW mind. The failure reviews were not conclusive, there was no verification by an International Oversight Committee (IOC) and although the two last flights were successful, nobody was able to demonstrate why the flights were successful. Most of the UWs will let no chance to approximate conclusion. UWs are saying that for the first failure they were flexible, for the second failure they were less flexible but they gave a last chance. Now for the third failure, there is no place for any flexibility.*
- b) The first element from the review board show clearly that the failure affects a single point of failure. Most of the main Western launchers (Ariane, Delta, Atlas) have a redundant Inertial platform. Single point of failure is not acceptable for western specification but there is some provisions to cope with them. Either you remove it or you demonstrate without any doubt that your reliability level of your unit is such that it is acceptable compared to the overall system reliability. Because it is out of the question that CGWIC [China Great Wall Industry Corporation] and CALT [the China Academy of Launch Vehicle Technology] soon add a redundant Inertial Platform, we have to deal with the second option. UWs will be very serious about the way CGWIC and CALT addresses this single point of failure.*

From the above reasons, we can define the minimum set of





Associated Press

Western rockets such as (from left to right) the Ariane (France), Delta (U.S.), and Atlas (U.S.) have a redundant inertial platform, one feature that distinguishes them from PRC rockets. For this reason, space insurance underwriters and brokers were especially concerned with the failure of the inertial platform on the Long March 3B.

requirements needed to ensure a reasonable chance that UWs are confirming their commitment:

- 1) *The Preflight meeting shall provide clear conclusions which are subject to no controversy. These conclusions shall be supported by a detailed and clear demonstration. The level of the conclusion shall be enough to support an isolation analysis for the [Long March 3]. This last point means that it will be acceptable to UWs to wait for the [Long March 3B] recovery plan, but it is out of question that all causes are not identified and demonstrated for the [Long March 3] isolation analysis. In other words, saying that the electrical motor is the cause of the problem is not enough. We shall know why the motor failed.*
- 2) *The isolation analysis will be of key analysis. UWs are not expecting to listen [to] a set of arguments telling that the two platforms are different and that [Long March 3] plat-*



form has flown more than thirty times. This is a single point of failure and this type of argument is not acceptable. If it appears that the electrical motor is the most probable cause of failure, then the same problem could happen to the [Long March 3] platform. UWs are expecting a detailed reliability analysis demonstrating what is the real level of reliability of this platform. I think however that such analysis does not need to be finished for the Preflight meeting in Beijing. At this meeting CGWIC and CALT shall show that such study is underway and that its conclusions will be ready soon (2 to 4 weeks) and in any case before Apstar-1A launch. UWs will then subject their commitment to satisfactory conclusions. We shall take some provision in the planning to let the UW to review this analysis (1 week).

- 3) *Just after the news of the failure of the flight Intelsat-708 was made public, the UWs required the setting up of an IOC (Independent Oversight Committee) [that is, the IRC]. This is a common practice for any failure with any western launch vehicle failure, but because there was no IOC to provide any conclusion for the previous flights' failure, UWs made strong comments that one condition before they agree to any conclusions, is that the work of the failure review board being reviewed and agreed by an IOC. The composition and the mandate of this IOC should be subject to UW approval. The UWs understand very well that it is not possible that the IOC will [have] proved their conclusions at the pre-flight in Beijing March 15, 16. The time available is not sufficient. However, as a minimum condition, they want to see that the IOC has been formed and that the mandate has been officially defined. Furthermore they will request that the IOC conclusion to be known before the launch of APSTAR-1A for they [sic] review. UWs expect a clear commitment from the Chinese official[s] which guarantee[s] that whatever the conclusions should be, the IOC*



*will be free to publish their conclusion. UWs expect with the forming of the IOC a sign of openness from CGWIC and CALT.*⁴⁵

On April 4, 1996, J & H Marsh & McLennan stated that it had “*not received any official advice*” from China Great Wall Industry Corporation that the Independent Review Committee would be formed, “and if and when it’s formed, as to who will be invited.” The J & H Marsh & McLennan Beijing office was instructed to act as a liaison for continuing communication with China Great Wall Industry Corporation officials in this regard.

O’Connor wrote on April 4, 1996, that “[i]t is difficult for us to prompt China Great Wall Industry Corporation any more than we have (which has been on a daily basis).” J & H Marsh & McLennan was “awaiting the decision of China Great Wall Industry Corporation on the final list of the space industry experts who will participate in the International Oversight Committee (IOC).”

In an issues paper for the April 15 and 16 meetings prepared by J & H Marsh & McLennan, Masson and O’Connor noted that “[r]einsurers have insisted that an IOC [Independent Oversight Committee, i.e., the IRC] be formed by the China Academy of Launch Vehicle Technology to oversee the failure review for the [Intelsat] 708 mission failure. It is standard practice for Western launch service providers to establish an IOC immediately after a mission failure.”⁴⁶

Reinsurers made the formation of an Independent Review Committee an “absolute requirement” prior to approval of the Apstar-1A launch campaign, since the China Academy of Launch Vehicle Technology had previously failed to use an Independent Review Committee for failure reviews: “[t]he [Long March 3B-Intelsat 708] failure review must be reviewed and endorsed by an IOC.” Reinsurers would interpret a refusal as a sign of the China Academy of Launch Vehicle Technology’s reluctance to be open about its failure review.⁴⁷ Furthermore, J & H Marsh & McLennan believed that the minimum requirements regarding the Independent Review Committee were:

- **That it be created with a defined mission prior to the**



April 15 and 16, 1996, insurance meeting

- **That its membership be independent and international, with unrestricted review authority**
- **That the final report be published and reviewed by reinsurers prior to the launch of Apstar-1A**⁴⁸

On April 4, 1996, O'Connor wrote Professor Bao Miaoqin:

*We understand that Intelsat has declined to participate in the IOC [i.e., IRC]. Yet, to date, there has been no announcement by CGWIC [China Great Wall Industry Corporation] on this issue. A formal announcement should be made about this matter and a satisfactory replacement for Intelsat must be found as a matter of urgency.*⁴⁹

As of April 4, 1996, China Great Wall Industry Corporation said it was trying its best to establish an Independent Review Committee according to the minimum conditions set by the PRC-controlled Asia Pacific Telecommunications Satellite Co. and J & H Marsh & McLennan, and had developed a working schedule for such a group.⁵⁰

According to Timothy Rush, former Intelsat program manager, the PRC set up the Independent Review Committee in order to remain in the launch services business. The parties with the most incentive to urge the creation of the Independent Review Committee were customers who needed launch services, and China Great Wall Industry Corporation. China Great Wall Industry Corporation feared that additional customers would cancel contracts unless it provided more reporting on the Long March 3B-Intelsat 708 failure.⁵¹

Donald Bridwell, manager of Intelsat's Major Programs Office, advised the Select Committee that "the next insurer would want to know about the failure." The next insurance broker for a PRC launch was J & H Marsh & McLennan, acting for the Hughes-built Apstar-1A.⁵²

J & H Marsh & McLennan's Hewins, then Chairman of the firm's Space and Telecom Group, says he does not recall how the Independent Review Committee was formed. He does remember that he contacted the PRC-controlled Asia Pacific



Telecommunications Satellite Co., the satellite customer for the next launch of a Long March rocket, and the underwriters for that next launch of a Long March rocket, following the Long March 3B-Intelsat 708 failure. Hewins does not recall any specific information being shared with the insurance industry after the failure.⁵³

J & H Marsh & McLennan's Quinn, then a Vice President in the Space and Telecom Group, states that there may have been discussions regarding improving the reliability of China Great Wall Industry Corporation's rockets in a general sense.

Quinn says he was not aware that anyone at J & H Marsh & McLennan communicated to Loral or the Independent Review Committee regarding the PRC improving its launch capabilities. The first time that Quinn recalls hearing of the Independent Review Committee was in his office with Paul O'Connor, another J & H Marsh & McLennan Vice President on the Space and Telecom Group; he recalls that "Paul [O'Connor] was involved in it."

Quinn says he does not know, however, who requested the Independent Review Committee. He speculated that it may have been Asia Pacific Telecommunications Satellite Co., Hughes, the PRC, or the insurers.⁵⁴

The April 15-16, 1996 Insurance Meeting in Beijing

J & H Marsh & McLennan's Quinn recalls that an insurance meeting was held in Beijing on April 15 and 16, 1996 for the Apstar-1A satellite launch insurers.⁵⁵

The China Academy of Launch Vehicle Technology and China Great Wall Industry Corporation launch service representatives presented possible causes of the failure of the Long March 3B carrying the Intelsat 708. The PRC representatives reported what they had done to date, and that work was ongoing. They summarized telemetry and tracking data.⁵⁶ According to Quinn, the meeting constituted the first time that the underwriters received any information about the Long March 3B-Intelsat 708 failure.⁵⁷

Quinn says that representatives from Loral, Hughes, the PRC-controlled Asia Pacific Telecommunications Satellite Co., China Great Wall Industry Corporation, J & H Marsh & McLennan, and other insurance companies attended the meeting.



Quinn says that he does not recall Nick Yen, Secretary of the Independent Review Committee and a Loral employee, being present at the meeting. Loral's Dr. Wah Lim, Chairman of the Independent Review Committee, Dr. John Smay, Independent Review Committee member and employee of Hughes' Chief Technologist and another unidentified Hughes representative were present, but Quinn does not recall whether any of them made any presentations.⁵⁸

Quinn says that PRC representatives interacted with underwriters at the meeting through presentations in a controlled environment. He recalls that a Defense Department monitor was present. Quinn says that Asia Pacific Telecommunications Satellite Co. and China Great Wall Industry Corporation made presentations to approximately 10 to 15 insurance company representatives, describing what happened in the Long March 3B-Intelsat 708 failure, and why it would not happen in the Apstar-1A satellite launch.

J & H Marsh & McLennan's Quinn says he does not recall whether the Independent Review Committee gave a presentation.⁵⁹ Quinn says that his role at the meeting was to "make sure things ran smoothly." In his view, members of the Independent Review Committee attended the meeting to "try to provide some comfort" to the insurers, but he does not know whether PRC representatives provided information or produced a report.⁶⁰

Quinn recalls that his colleague, Paul O'Connor, played a liaison role for the meeting because he was the J & H Marsh & McLennan account manager for the Apstar-1A insurance program.⁶¹ O'Connor assisted in inviting the attendees, and the PRC-controlled Asia Pacific Telecommunications Satellite Co. may have provided some assistance.

Intelsat's Edwards says he and two or three technical managers from Intelsat attended the meeting. Although Edwards does not recall specifically who went, all of the Intelsat attendees were from the Intelsat Launch Vehicle Programs Office. Edwards says that he does not recall whether Lim or Yen were present at any technical meetings or briefings he attended.

Two to three representatives from the China Academy of Launch Vehicle Technology were present. Six to eight representatives from China Launch and



Tracking Control, the PRC organization which tracks the status of satellites, also were present, along with two to three representatives from the Xichang launch site. Intelsat's Edwards says he did not see any subcontractors from China Great Wall Industry Corporation at the meeting, but that there might have been a representative from Loral present.⁶²

Quinn says that copies of the PRC's presentation were distributed to the underwriters, Independent Review Committee members, and J & H Marsh & McLennan staff.⁶³ Quinn does not know the terms on which the presentation was distributed.⁶⁴ Edwards says he does not recall a written report from the PRC at the meeting in Beijing.⁶⁵

At issue at the conclusion of the meeting was Asia Pacific Telecommunications Satellite Co.'s desire to authorize Hughes to ship a satellite to the PRC for launch, provided insurance coverage was maintained. The underwriters agreed that Asia Pacific Telecommunications Satellite Co. could so authorize Hughes, but that this action did not obligate them to offer insurance.⁶⁶

Thus, the insurance issue was still outstanding after the April 15 and 16, 1996, meeting. The underwriters agreed to discuss the insurance aspects in greater detail and request more information from China Great Wall Industry Corporation. Asia Pacific Telecommunications Satellite Co. representatives were hopeful that the insurance issue would be resolved prior to the launch.⁶⁷

On April 17, 1996, O'Connor wrote to Diane Dwyer, a colleague at J & H Marsh & McLennan:

The briefing went very well and we have a great result, the Apstar-1A satellite has been approved for shipment to the launch site, ready for launch. Final launch approval will be provided when a number of action items are completed, mostly, conditions precedent for the launch approval. All are skeptical of [China Great Wall Industry Corporation]'s ability to deliver, especially on time, but there's always a first time . . .

Underwriters are no longer cynics, but have a cautious optimism for the ability of the Chinese to improve their game.



International review committee has been established, chaired by an SS/L guy, Wah Lim.⁶⁸

On April 23, 1996, an information release by China Great Wall Industry Corporation noted:

Representatives from Hughes and Apstar-1A reinsurance program were jointly invited by China Great Wall Industry Corporation (CGWIC) and APT Satellite Co., Ltd. (APT) to participate in the Apstar-1A Pre-Flight Technical Briefing held in Beijing from April 15 to 16, 1996 . . .

Prior to the meeting, an Independent Review Committee (IRC) constituted by specialists from international space industry had already been set up by CGWIC. Independent review of the [Long March 3B] launch failure investigation will be performed by the IRC. IRC members were invited and some were able to [be] present [at] the 2-day meeting.⁶⁹

The Space Insurance Industry's Involvement In the Release of the Independent Review Committee's Interim Report

J & H Marsh & McLennan's Vice President Timothy Rush says that his firm's office in Washington, D.C. did not receive the Independent Review Committee report, nor had anyone at that office reviewed it. Insured parties are required to provide underwriters with claim-related information, but Rush says that underwriters were not provided with the Independent Review Committee report in the Intelsat 708 case.⁷⁰

Richard Hewins, then Chairman of J & H Marsh & McLennan's Space and Telecom Group, says he does not recall reviewing the Independent Review Committee report of the Long March 3B-Intelsat 708 failure, although he recalls seeing it come across his desk in the spring of 1996. Hewins says he does not know what happened to the report and does not recall the process by which he obtained it.

Furthermore, Hewins does not recall whether the report was distributed to other



J & H Marsh & McLennan offices, although he says that it may have been sent to Jacques Masson in the J & H Marsh & McLennan office in Paris, and to the firm's London office. Hewins does not recall any discussions with underwriters or re-insurers after the Intelsat 708 failure.⁷¹

On May 7, 1996, J & H Marsh & McLennan's Vice President Paul O'Connor advised Professor Bao Miaoqin of the PRC-controlled Asia Pacific Telecommunications Satellite Co.: "It is in APT's best interests that the interim IRC report be released by J & H Marsh & McLennan to Asia Pacific Telecommunications Satellite Co.'s reinsurers first, before China Great Wall Industry Corporation releases it to other customers and underwriters."⁷²

On May 13, 1996, O'Connor wrote to his colleague at J & H Marsh & McLennan, Diane Dwyer, that: "Lim has approved release of the IRC interim report to J & H Marsh & McLennan so we can release this to all non-PRC reinsurers. Asia Pacific Telecommunications Satellite Co. has agreed with this as well. The report will be delivered to our office today. Nick [Yen] will be faxing a copy of the 30 page key part today" ⁷³

On May 13, 1996, O'Connor advised Yen:

We understand the release of the report is subject to the restrictions on use contained in the export regulations affecting the satellite and the IRC's review of the failure investigation.

J & H undertakes to release copies of the report only to organizations or individuals of subscribing countries.

J & H further undertakes not to release a copy of the report or any extracts to PRC nationals or organizations, or to APT.⁷⁴

On May 13, 1996, Loral's Dr. Lim contacted O'Connor:

Attached please find a copy of the IRC's Preliminary Report regarding the investigation of the [Long March 3B] launch failure and the [Long March 3] isolation evaluation. This report is currently under the review of our legal consul [sic]



and the U.S. technology export panel.

Prior to obtaining the proper export license, the IRC was advised that this report can be used strictly only by the U.S. companies and European companies as long as they are registered within the ITAR member countries.

This report will not be delivered to [China Great Wall Industry Corporation] and its launch service agencies until the export license or an equivalent authorization is obtained.⁷⁵

On May 14, 1996, Franceska O. Schroeder, an attorney for J & H Marsh & McLennan, advised Loral's Lim:

Paul O'Connor of Johnson & Higgins Space & Telecom Group has asked me to contact you regarding the proper procedures for releasing the interim Independent Review Committee (IRC) Report dated May 10, 1996.

I understand from Mr. O'Connor that in a communication from you to him dated May 13, 1996, you explain that the Report currently is under review by the "U.S. technical export panel." You further explain that the IRC has been advised that prior to obtaining proper export licenses, the Report is to be used "only by the U.S. and European companies" that are "registered within the ITAR-member countries."

Because we do not know the identity of the "ITAR-member countries" to which you refer or the specific export control requirements imposed by the U.S. government relative to this project, we have advised Mr. O'Connor not to release the Report until we clarify with you how to proceed.⁷⁶

On May 14, 1996, J & H Marsh & McLennan's attorney Schroeder communicated to her clients O'Connor and Dwyer:

[T]he ITAR [International Traffic in Arms Regulations] governs



the export of certain sophisticated U.S. communications satellites and associated technical data. This means that any such satellites and technical data may be exported or exported only pursuant to a license issued by the U.S. Department of State.

Even if the phrase “ITAR-subscribing country” was replaced with “Missile Technology Control Regime (MTCR)-subscribing country” (I have the list of such countries) a U.S. license still would be required for the export of ITAR-controlled satellites and technical data.

The U.S. satellite manufacturer usually bears the responsibility for obtaining such a license[s].⁷⁷

On May 14, 1996, Loral’s Yen reported to J & H Marsh & McLennan’s O’Connor: “The IRC may require a technical export license for the subject matter which may result in an [sic] revised version in wording. However, the technical contents and assessment in the report as faxed in this package remain valid.”⁷⁸

On May 31, 1996, O’Connor advised China Great Wall Industry Corporation:

[T]he US State Department has issued a formal decision that the release of the IRC Interim report is not allowed and that the IRC’s chairman, Dr. Wah Lim[,] is no longer allowed to offer public comment on the report or its contents.⁷⁹

In June 1996, Masson of J & H Marsh & McLennan’s Paris office wrote his firm’s O’Connor:

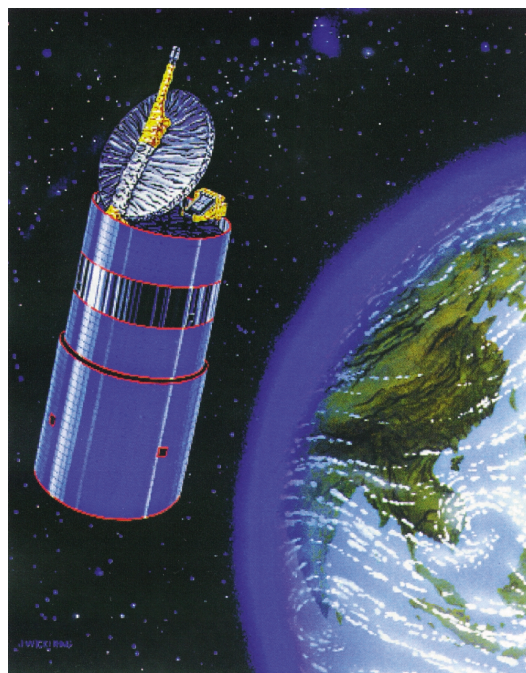
The discussions with the French underwriter, LRS [La Reunion Spatiale] and AGF [AGF Reassurances] were very lengthy and difficult. As you might know, the main problem is the IRC report availability and we had to try to find a compromise. The French do not appreciate the decision from the US government, and most importantly because France has signed the ITAR agreement with the US.



The main spirit which prevails is that [the PRC-controlled Asia Pacific Telecommunications Satellite Co.] shall not pay for the political dilemma and to some extent, that since J & H has made a great effort to solve the problem, it should be not fair that J & H should pay as well.

Any decision taken by the Underwriters will be highly political and commercial.⁸⁰

On June 5, 1996, Masson, on behalf of the French insurance community, proposed a way in which to circumvent U.S. export policy regarding the release of the Independent Review Committee:



Insurance underwriters and reinsurers for the Apstar 1A satellite program – the next scheduled satellite to be launched on the PRC's Long March B rocket after its 1996 crash – were concerned about the reliability of all Long March rockets. When the Independent Review Committee provided a report diagnosing the Long March 3B's problems and presenting remedies, the insurance industry proposed a way to circumvent U.S. export policy that prevented its release.

Some of the IRC members are European and to that extent they could be approached directly without going first through US officials.

My recommendation will be that [the China Academy of Launch Vehicle Technology] and [China Great Wall Industry Corporation] which mandated the IRC, asks to one or all the European IRC member to sign this certification. The certification shall state that the IRC member certifies that the conclusion of the IRC interim report is not in disagreement with the conclusions of the report RA1-3-4 on the [Long March 3 and Long March 3B] isolation analysis.⁸¹

On June 6, 1996, Lim advised O'Connor:

I have been instructed by our legal counsel to retrieve all IRC-generated documents which the IRC has transmitted to you by fax, express mail or by distribution at any meetings.

In addition, please confirm that no derivative copies of these documents were made or distributed, or that any such copies have been retrieved and returned to us.

The above is necessary to comply with U.S. Government requests.⁸²

On June 19, 1996, Dwyer reported to Lim:

[W]e have gathered all photocopies and all documents relating to the Independent Review Committee's Interim Report. They are being shipped to you by Airborne Express overnight courier service.⁸³

Included in the package were 22 copies of the Report, copies of all correspondence relating to the release of the Report and the decision not to release the Report, and copies of all correspondence relating to the need to return all copies.



CHRONOLOGY OF KEY EVENTS

1996

- February 15** **The Loral-built Intelsat 708 launch fails.**
-
- February 21** **A confidential agreement for risk management** advisory services is reached between J & H Marsh & McLennan, insurance broker for the Apstar 1A program, and China Great Wall Industry Corporation.
- Paul O'Connor, J & H Marsh & McLennan Vice President, suggests that China Great Wall Industry Corporation** implement an aggressive public relations campaign for underwriters. “Quick and decisive action is required.”
-
- February 22** **Jacques Masson, Manager of J & H Marsh & McLennan’s Paris office, reports discussions with French insurance community** regarding the Intelsat 708 failure’s impact on future insurance programs.
- Masson first mentions the necessity to create an “independent inquiry board.”**
-
- February 26** **Underwriters for the Apstar 1A program become increasingly disappointed** regarding the lack of an independent and international failure review committee.
- O’Connor provides China Great Wall Industry Corporation with a failure review committee schedule** modeled after an Ariane failure review plan, and urges China Great Wall Industry Corporation to allow J & H Marsh & McLennan to obtain failure review conclusions.
-
- February 28** **J & H Marsh McLennan’s O’Connor outlines for China Great Wall Industry Corporation** minimum requirements for the Apstar 1A reinsurance program to continue.



March 11 **Loral offers to provide technical assistance to the Intelsat 708 failure investigation.**

March 20 **French underwriters state minimum requirements** for the Apstar 1A insurance program to continue.

Discussions regarding Loral participation in the Independent Review Committee continue among China Great Wall Industry Corporation, J & H Marsh & McLennan, and the underwriters.

J & H Marsh & McLennan’s Masson identifies potential Independent Review Committee participants.

March 21 **Bermuda-based underwriter, ACE Limited,** advises J & H Marsh & McLennan that China Great Wall Industry Corporation’s actions regarding the Intelsat 708 failure investigation are unacceptable and that the Apstar 1A insurance contract is in jeopardy.

April 1 **J & H Marsh McLennan’s O’Connor reports that Intelsat declined to participate** in the Independent Review Committee.

April 5 **China Great Wall Industry Corporation reports to J & H Marsh & McLennan that an Independent Review Committee is being established** to meet the insurance community’s minimum requirements to insure the upcoming Apstar 1A launch.



THE COMMERCIAL SPACE INSURANCE INDUSTRY

Introduction: The Market

Emerging commercial space technologies, along with complex and substantial financial investments, presented a new type of high-risk exposure. Thus, the space insurance underwriting community was developed, and the niche for specialized insurance was filled. The space insurance market is highly competitive, dynamic, and volatile with a relatively small group of U.S. and European insurance companies in the forefront.⁸⁴

According to one industry representative, Dowa Fire, Marine & Space Insurance:

The number of launches of currently insured commercial satellites is about 20 to 30 satellites per year, so the number of contracts is limited

Again, according to Dowa Fire, Marine & Space Insurance:

*Since space insurance coverage began in 1965, the capacity of the market has been steadily increasing.*⁸⁵

This upward trend has been driven by expansion in the communications satellite industry and by growing demand for cheaper, more reliable, and more capable launch systems.

Over the last 30 years, space insurance companies have collected approximately \$4.2 billion in premiums and paid nearly \$3.4 billion in claims. As outer space is being increasingly used for communications, broadcasting, and remote sensing, the demand for space-based activities is expected to grow, helping risks stabilize. Insurance premiums will thus decrease, and market capacity will in turn increase.⁸⁷



Space insurance is syndicated, meaning that each individual underwriter assumes a percentage of the risk.⁸⁸ Approximately 10 to 15 large companies, and 20 to 30 smaller companies, may participate in a given insurance package. Typically, multiple insurance underwriters cover each risk for a fractional share, thereby spreading the risk throughout the global markets.⁸⁹

An insurance package covers risk to the rocket, the satellite, and related equipment.⁹⁰ Factors such as market conditions, the type of rocket, orbital deployment conditions, and satellite characteristics determine insurance terms and conditions. While all underwriters use similar terms and conditions, commercial space insurance policies are individually crafted, principally based on the specifications of the satellite and the rocket.⁹¹ The coverage period, premium rates, and other terms and conditions are negotiated among the client, the satellite owner or manufacturers, and the underwriters.⁹²

Competition determines which insurers will participate in a specific placement, and the marketplace sets pricing for each policy. Price and availability of space insurance depends primarily on the lead underwriter's ability to understand and assess the intricacies of each risk.⁹³

The estimated space insurance market capacity is between \$850 million and \$1 billion for each satellite program, with an estimated range of \$250 to \$300 million per launch.⁹⁴ Approximately seven to ten underwriters play a significant role in the market, and Europeans ordinarily account for \$500-600 million out of the \$1 billion available for a single satellite project.⁹⁵ Typically, an insurance underwriter will commit only 80-85 percent of its available financial resources to one program.⁹⁶

Space insurance market conditions are cyclical in nature. Currently, the market is “soft,” producing more capacity to meet risk needs, and is a buyer's market with many qualified insurers.⁹⁷ Launch service providers are more willing to introduce new launch vehicles in this type of market. In contrast, in a “hard” market, or seller's market, underwriters have the greatest influence. Successful market participants must respond to and implement changes within the dynamic satellite launch equipment, launch services, and space insurance markets.

The four primary U.S. insurance brokers are J&H Marsh & McLennan, with about 60 percent of the market, Willis Corroon Inspace, International Space Brokers,



and AON, Inc.⁹⁸ Currently, there are 10 to 12 lead underwriters, including one Australian, two French, one U.S., and two British.⁹⁹ The U.S. underwriters account for 20 to 30 percent of current space insurance syndication.¹⁰⁰

Each individual U.S. underwriter has a detailed technical understanding of space risks — based on its own spacecraft engineers — and a sophisticated space industry database.¹⁰¹ Some European underwriters employ consultants with expertise in the technical assessment of space risks, including experienced former NASA satellite engineers.¹⁰²

Any underwriter may spread the risk to any other insurance company or reinsurer by selling participation in a particular insurance program.¹⁰³ Reinsurers receive no technical information but rely on representations by lead underwriters as to risk.¹⁰⁴ Reinsurers occupy numerous layers in the insurance industry, sharing the risk of a particular contract.¹⁰⁵ The reinsurers depend on their relationship with the underwriters and “follow the fortunes” of the underwriters, referred to as “following-on.”¹⁰⁶

There are four essential types of space insurance:

- **Pre-launch insurance**, specifically property and cargo insurance,¹⁰⁷ covers satellites and rockets prior to launch. Pre-launch insurance usually covers risks associated with transportation of the satellite from the manufacturing facility to the launch site, assembly on the launch pad, inspection, and pre-lift-off activities. The period of coverage ends with the intentional ignition or lift-off of the rocket.¹⁰⁸
- **Launch insurance** is the most common type of space insurance. It may extend from six months to one year after launch. Coverage commences where pre-launch insurance ends. Launch insurance terminates when the satellite separates from the rocket and completes an initial operational phase of functionality testing. The launch period may last approximately 20 to 30 minutes.¹⁰⁹
- **In-orbit insurance** commences after the satellite has completed its initial operational phase of functionality testing,



and normal operations in space begin. The life expectancy of a satellite is approximately 10 years and ends when the satellite’s fuel cell depletes. In-orbit insurance usually consists of one-year renewable policies. “[I]n order for the insurance companies to renew the In-Orbit insurance, they require ‘health reports’ from the insured regarding the condition of the satellites. Based on these reports they accept renewed coverage.”¹¹⁰

- **Third-party liability space insurance** covers legal liability arising from damage to a third party during the launch or the in-orbit operations of a satellite program. A variety of coverage options are available: personal injury, property damage, damage to U.S. Government launch facilities, loss of revenue, service interruption, and material changes to ground stations.¹¹¹

Self-insuring for the launch phase is not a common practice. PRC-owned and manufactured commercial satellite launches in the PRC, however, usually are self-insured by the PRC.¹¹²

Broker Selection and the Underwriting Process

Broker Selection

The following summarizes the space insurance acquisition process and the parties involved. First, a satellite owner contracts with a satellite manufacturer to build a satellite.¹¹³ Next, the insured client, a satellite owner or satellite manufacturer, obtains a list of brokers from the manufacturer.¹¹⁴

Then, the broker is appointed following a competitive process.

The broker may negotiate insurance, manage transactions, and, if necessary, settle claims that may arise on behalf of the client.¹¹⁵ The broker acts as a conduit for all documentation and information.¹¹⁶ Its primary task is to obtain technical questions



from underwriters and answers from the satellite owner and manufacturer.¹¹⁷ The broker may assist the satellite owner and manufacturer in developing a presentation and pricing plan for the underwriters.¹¹⁸ Brokers do not suffer monetary risk in the event of launch accidents; they are paid on a commission basis.¹¹⁹ Traditionally, commission size depends on the final premium negotiated for the insurance program. The higher the insurance premium, the higher the broker's commission.¹²⁰

Insurance Acquisition

The underwriting process begins with a technical assessment of the satellite and rocket.¹²¹ The client prepares technical reports and presentations regarding the satellite and rocket for the brokers.¹²² Usually, the satellite manufacturer prepares the initial project package containing detailed technical information and launch service procedures.¹²³

This package is presented to the underwriters by the broker.¹²⁴ The technical information consists of the specifics of the launch and satellite operations, coverage for partial or full loss, associated costs, and launch service availability.¹²⁵ Also, it includes the program risks, history of the rocket, modifications, and reasons for using new technology, if any.¹²⁶

The presentation is designed to build the confidence of the underwriters in the insured client.¹²⁷ Technical questions regarding the following are often raised by the underwriters:

- **Communication systems**
- **Payload**
- **Electrical power system**
- **Attitude control system**
- **Mechanical systems, including appendage and solar arrays**¹²⁸

Normally, two rounds of questions and answers by the satellite manufacturer and launch service provider to underwriters are sufficient to complete the bidding phase.¹²⁹ Additionally, underwriters rely on databases and their own technical staff or other experts for information.¹³⁰



Typically, non-disclosure agreements binding underwriters accompany technical materials for the presentations.¹³¹ Underwriting information is part of the insurance contract, and the insured is obligated to use its best efforts to provide insurers with information relating to risk of loss.¹³² The insured has an obligation to notify the underwriters if any characteristic of the satellite or the launch service changes.¹³³

A second briefing to the underwriters may be necessary if such a “material change” occurs affecting the terms and conditions of the policy. In the case of Intelsat 708, for example, Loral had to make such a presentation after changing the material that was used for the satellite’s solar arrays to gallium arsenide.¹³⁴

The underwriters submit bids for the insurance package, including a decision to insure the satellite program, the amount of the premium, and the terms and conditions of the policy. Various risk assessment factors, including the history and reliability of the hardware to be used, are discussed. Also, previous failure and success rates, disposition of previous failures, experience of operations and operators, testing and product assurance provisions, and monitoring conditions by the satellite manufacturers or the insured are factors taken into account.¹³⁵

Lastly, the policy is negotiated and written prior to launch.¹³⁶ The insured client, acting through the brokers, answers any outstanding questions from the underwriters.¹³⁷ Post-launch reporting advises the underwriters of the mission’s progress.¹³⁸

The entire insurance acquisition process takes about one year to complete.¹³⁹ Typically, insurance contracts are finalized from six months to three years prior to launch.¹⁴⁰

Space Insurance Premiums

A space insurance deposit between 10 and 20 percent of the premium is required when the policy period commences. The balance of the premium is usually due to the underwriters no later than 30 days prior to the launch.¹⁴¹

Typically, insurance premiums range from eight to 15 percent of the total costs associated with a launch.¹⁴² Premium rates have declined over the last few years.¹⁴³ Even though there have been a large number of substantial claims in the last few



years, premiums decreased by 50 percent in 1997.¹⁴⁴ Claims incurred will surpass premiums collected in 1998, a disappointing year for underwriters.¹⁴⁵

Launch insurance premiums depend on such factors as:

- **Reliability of the rocket**
- **Reliability of the satellite**
- **Level of complexity of the satellite**
- **Scope of coverage**
- **Amount of insurance**¹⁴⁶
- **Rocket history**
- **Overall design of the satellite**
- **Product assurance plan**
- **Satellite's operational lifetime**
- **Insurance capacity**
- **Commercial versus government launched**
- **Regulatory standards for rockets**¹⁴⁷

According to a September 1998 article: “[C]ustomers can pay less than 10 percent [of the total costs] with an emphasis on launch-plus-3-year or even launch-plus-5-year coverage plan . . . In-orbit policies are generally negotiated separately from launch plus 3 or 5 year policies. Rates tend to be 1.2 to 1.5 percent per year at present.”¹⁴⁸

Space Insurance Claims of Loss

Despite the availability of insurance, the satellite owner has every incentive to place the satellite in orbit and make it operational because obtaining an insurance settlement in the event of loss does not help the owner continue to operate its telecommunications business in the future. To increase the client's motivation to complete the project successfully, underwriters will also ask the client to retain a percentage of the risk.¹⁴⁹

Insurers are advised of any occurrence likely to result in a claim. The insured is obligated to disclose any relevant issues, including the results of any failure investi-

gations.¹⁵⁰ The insurers must have this information—and a substantiated theory of the failure—from the parties that were involved in the launch.¹⁵¹

The claims settlement process continues until agreement is reached on the loss sustained.¹⁵²

In the event of a launch or satellite failure, the insurance representative of the insured client is responsible for drafting the Proof of Loss and Notice of Loss:¹⁵³

- **The Proof of Loss** is a statement issued to the insurers and is signed and notarized by the insured client. It includes the time the loss occurred, details as to what happened, and technical information such as telemetry data, frequencies, and power levels at the time of the failure.¹⁵⁴
- **The Notice of Loss** is a one-page statement that places the insurers on notice of a possible claim.¹⁵⁵

Both statements are provided to the insurers by the insured client through the broker.¹⁵⁶

The Applicability of Export Controls To the Space Insurance Industry

Security Clearances and the Transfer of Controlled Technical Information

The broker reviews drafts of the Proof of Loss and Notice of Loss and makes sure that all relevant information is contained therein. The broker does not alter them, but offers suggestions as to changes.¹⁵⁷ The broker is the last party to sign the statements prior to release of a claim payment.¹⁵⁸

Security clearance requirements for space insurance industry personnel handling sensitive data are not clear.¹⁵⁹

Timothy Rush, Vice President of J&H Marsh & McLennan’s Space and Telecom Group and a former Intelsat employee, testified that underwriter employees do not usually have security clearances.¹⁶⁰



In the case of Intelsat, data requiring protection is kept in a secure facility.¹⁶¹ Intelsat authorizes insurance-related technical information to be forwarded to the Defense Department for review.¹⁶² The Defense Department's responsibility is to monitor technical data reviews and transfers that take place in the course of the insurance process for space projects.¹⁶³

The amount of technical data that is required to be disclosed in the space insurance process depends on the maturity of both the satellite and the rocket.¹⁶⁴ Mark Quinn, former Vice President for J&H Marsh & McLennan's Space and Telecom Group, states that the information provided at space insurance presentations is "not very technical in nature."¹⁶⁵ Newer satellites and rockets, however, present greater risks since they are not technically and operationally known quantities, and the insurers thus want additional information about them.¹⁶⁶

Intelsat officials state that the PRC launch service provider receives only satellite interface information. Interface information consists of satellite dimensions and critical point locations of satellite components such as antennas. A user's handbook contains most of the information on rockets.¹⁶⁷

Nevertheless, as Donald Cromer, President of Hughes Space and Communications, who had attended insurance industry briefings, testified, technical information subject to export controls "could" be communicated in such briefings.¹⁶⁸

Export Licenses

According to insurance industry personnel, the obligation to obtain an export license rests with the owner of the technology. Thus, prior to Intelsat's taking title to the Loral-built Intelsat 708 satellite, Loral had the responsibility to obtain export licenses for all related exports of controlled technology.¹⁶⁹

The burden is on the insured client, agrees J&H Marsh & McLennan's Michael Hewins, former Chairman of that firm's Space and Telecom Group, to obtain all appropriate export licenses, and no special licenses are required by the space insurance industry.¹⁷⁰ In light of the destinations of the data, insured clients must determine whether the data is sensitive and export licenses are required.¹⁷¹



Hewins, a broker with substantial space insurance experience, says he believes that no export licenses are required for the space insurance presentations that contain technical information. Further, Hewins believes that no export licenses are required for the questions and answers that are passed between the underwriters, brokers and insured clients.

Hewins says that he assumes that all information shared in the insurance process is given to all entities, foreign or domestic, unless covered by non-disclosure agreements.¹⁷²

Another experienced broker, Timothy Rush of J&H Marsh & McLennan, says that the broker requires the originators of any technical data to certify that proper licenses have been obtained for technology transfers, or to certify that the data in question does not require such licenses for transfer.

According to Rush, brokers do not enforce licensing requirements. But, he says, brokers do help protect against technology transfers prohibited by U.S. law, by informing their insured clients of where they send any data the client submits to them under the insurance contract.¹⁷³

Yet another J&H Marsh & McLennan broker, Mark Quinn, says that the insured client is supposed to indicate whether an export license is in place for the satellite program. However, Quinn reports that he has not seen a technology transfer license, although he assumes one exists for each project.¹⁷⁴

According to Terry Edwards, Manager of Intelsat's Launch Vehicle Program Office, and Donald Bridwell, Manager of Intelsat's Major Programs in the Procurement Division: "Intelsat Headquarters Agreement does not exempt Intelsat from U.S. laws in respect to export licenses. U.S. spacecraft manufacturers are subject to U.S. export control laws." The export license, they say, covers the entire scope of the satellite project.¹⁷⁵

Intelsat's Edwards also states that Defense Department monitors have a very difficult assignment.¹⁷⁶ Quinn adds that the Defense Department monitor who worked on his project several years ago did a very good job and knew the details of the pro-



ject well.¹⁷⁷ However, Quinn states that he has not been present at any meeting where a Defense Department monitor has interceded to stop the transfer of technical information. He states that the briefer usually has a rehearsal briefing with a Defense Department monitor present, prior to the meeting.¹⁷⁸

Space Insurance and Export Controls for PRC Launches

The space insurance process does not differ for projects that include PRC rockets and satellites.¹⁷⁹

Insurance for PRC clients must comply with local regulations and is provided by re-insuring an indigenous insurer.¹⁸⁰ The PRC, however, does not have a developed insurance market. Therefore, a broker such as J&H Marsh & McLennan acts as an intermediary company since the PRC is not financially stable.¹⁸¹

J&H Marsh & McLennan's Hewins states that the PRC insurance companies, China Pacific Insurance Company (CPIC) and the People's Insurance Company of China (PICC), are difficult to deal with from a business standpoint. Further, CPIC and PICC are not lead underwriters in the international market, do not possess satellite insurance expertise, and tend to work on multiple projects.¹⁸²

The J&H Marsh & McLennan Beijing office handles property and casualty insurance for the PRC, and for U.S. companies conducting business there. The J&H Marsh & McLennan London office also issues third-party liability insurance for China Great Wall Industry Corporation.¹⁸³



