

# Interview

## Ignacio Martínez de Baroja

Consultant to Hispasat  
on Risks and Insurance

The market for space insurance, specifically satellites, is as specialised as it is unknown. After several years of losses, it has still not recovered from the latest claims suffered in the last year. Increased safety in the latest launches, together with technical innovations in satellite platforms and new shuttles, bode well for future improvements in the present difficult situation. The Hispasat Group, which has Spanish and European capital and has names such as Eutelsat, Auna, Telefónica, BBVA, INTA, EADS and SEPI amongst its principal shareholders, has attained the position of leading satellite services operator in the Spanish market with a major presence in Latin America. Each new project, as well as the launch and placement in orbit, is covered by a comprehensive insurance programme.

“ *Satellite insurance is a complex market* ”



**Ignacio Martínez de Baroja** was born in Calahorra, in the province of La Rioja, on 29 November 1943. He received a law degree from the Universidad Complutense in Madrid and is a practising lawyer. He holds a Master's in Maritime Business from the Spanish Maritime Institute and is qualified as a loss adjuster and insurance broker.

He has been a member of the Board of the Association of Spanish Risk and Insurance Managers since its foundation in 1984 and presently holds the position of Deputy Secretary. He is also a full member of the Professional Association of Engineers for Prevention and Protection against Fires (APICI). He is a member of the Royal Academy of Jurisprudence and Legislation.

Between 1973 and 1998 he worked for Telefónica. In 1999 he began to act as an external adviser on risks and insurance to Hispasat. He works as a visiting lecturer in those organisations that seek his services and experience in connection with the management of risks and insurance for satellite and telecommunication programmes.



***If we were to summarise briefly the history of satellites, which milestones would you highlight? When did the insurance industry take its first steps in the space race?***

The development of geostationary satellites, which were non-military and commercial in nature, may constitute the starting point in the winter of 1954, when Arthur C. Clarke, journalist, engineer and author of 2001, *A Space Odyssey*, suggested in an article published in *Wireless World* that a communications satellite be used at a distance of 36,000 kilometres from the earth, for telecommunication links over a 120° radius. It would therefore be possible to cover the entire Earth's surface with three satellites. In 1957, the USSR put the first man-made satellite, *Sputnik 1*, into orbit. In 1960, *Echo*, which was a plastic and aluminium globe measuring 30 metres in diameter in low orbit, enabled the first experiments in link-ups to be carried out. Telstar 1 constituted a further milestone by circling in low orbit and facilitating the first television channel linkage. In 1965, *Intelsat 1 (Early Bird)* was launched, which was the first commercial satellite and also the first to carry launch insurance. It was not, however, until 1975 that another Intelsat became the first satellite to have insurance while in orbit.

***Which sections make up a satellite insurance programme?***

Preparation of an insurance programme must take into account many factors. Construction of a satellite takes more than three years, including the preliminary engineering work, during which time a technical analysis of the design and specifications is undertaken, together with review of the satellite construction contract, and of the launch and earth installation services. A financial and

business plan analysis is also carried out to ensure full awareness of the risks involved. During the pre-launch stage, where appropriate, insurance is taken out to protect construction of the satellite and the shuttle and also to cover the construction and the technical equipment of the space station responsible for monitoring and control. The pre-launch policy, in addition to cover for damage, includes such eventualities as loss of income, financial losses, late delivery, penalties, extraordinary costs, replacement of the shuttle, loss of insurance premiums, etc. The launch stage is insured by a one-year policy for

material damage and another one for public liability, principally for the eventuality that either the satellite or the shuttle, or any of their parts, fall to earth and cause damages or injuries. Time in orbit is covered by policies on material damage, public liability and loss of income, etc. At the end of their useful life, satellites are sent into an orbit for junk, which is located about 300 kilometres above the geostationary orbit. At no time during the launch operations, or at the launch itself, should either the shuttle or the satellite be without insurance, and indeed it is preferable that the policies of the operator, the launching agency and

## Landmarks in the history of satellites

- ▶ In the winter of 1954, Arthur Clarke published an article in the magazine *Wireless World* suggesting the use of geostationary orbit.
- ▶ 4 October 1957. *Sputnik 1*, the first satellite
- ▶ 1 February 1958. *Explorer 1*
- ▶ 18 December 1958. First telecommunications satellite (Score)
- ▶ 12 August 1960. *Echo1* satellite
- ▶ 1962. Launch of *Telstar 1* (ATT)
- ▶ 19 August 1964. SYNCOM satellite in geostationary orbit
- ▶ 6 April 1965. First international communications satellite with launch insurance: *Early Bird* (Intelsat 1)
- ▶ 1968. Launch of *Molniya* (not in geostationary orbit)
- ▶ 1975. Launch of *Gorizont* (geostationary orbit)
- ▶ 1975. First insurance policy for a satellite in orbit

## interview

### ► Satellites – a great variety of uses

The business offered by satellites of providing services from space has developed in an encouraging manner and will, without doubt, increase rapidly in future with the aid of technology and the introduction of new applications. Amongst the range of services that satellites provide are the following:

- Telephony and telecommunication networks
- Satellite television
  - TV links
  - Direct TV and digital platforms
- Data transmission – Internet
- Digital radio
- VSAT networks (business)
- Maritime navigation aid
- Air navigation aid
- GPS
- Teledetection
  - Meteorology
  - Cartography and land registry
  - Risk prevention
    - Watercourses and rivers (volume control)
    - Sea conditions
    - Fires
    - Control of oil pipelines
  - Exploitation of natural resources
    - Location of mines
    - Oil wells
    - Fishing banks
    - Agriculture
- Territorial surveillance
  - Military satellites
  - Observation satellites
- Scientific research satellites
  - Outer space and astronomy
  - Astrophysics
  - Space observatories (Hubble)
- Manned spacecraft: *Sputnik; Gemini; Apollo XI* (1969), US Space Shuttle *Discovery* (1981), Russian Space Station *MIR* (400km). International Space Station.

the satellite constructor overlap, rather than there be an absence of cover.

### ***What are the principal risks and what rates are applicable to satellites?***

Let us suppose, as is the case with Hispasat, that we are dealing with purely industrial companies. In the main, satellite insurance covers material damage. Insurance is on three levels: total loss, when there is a total failure of the satellite itself, or a launch fault; constructive total loss, which is when partial loss reaches a level that renders it no longer economically viable for the operator, and partial loss in the event of other elements of failure. A further important factor to be taken into account when assessing risk is asset depreciation: as the years go by, assets naturally fall in value. At present a satellite, with an insurance scheme in place, may cost up to EUR 350 million and insurance rates vary substantially. A few years ago it was possible to insure the launch and five years' orbit life for between 9% and 14% of its value, whereas today the launch rate may be up to 38%.

For each launch there is a public liability policy to cover damage to third parties at that precise moment, in compliance with the Agreement on International Liability for damage caused by space objects, dated 29 March 1972. Any country from which a launch takes place is considered liable for damage to third parties. This insurance covers all those with public liability, the launching agency, the operating owner, the contractors and subcontractors, etc., and normally lasts from launching until the end of the first year of operation. The government of the USA requires a policy of up to USD 500 million (EUR 398.31 million) for each launch. The risks covered relate to impact with other space vehicles, falling to Earth,

collision with other space objects, interference with other satellites, etc. There is also cover for public liability during its life in orbit. Finally, loss of profits in this type of business is of great importance, and for this reason it is advisable to arrange a policy for this eventuality, in the event that the satellite is lost, so as to be able to rent a satellite with the settlement received and service the affected clients. The preparation of this type of insurance is very time-consuming; in effect it involves drawing up a made-to-measure policy.

***What turnover does this international market have?***

Now, at the beginning of the year, the definitive data for 2003 is not available, although it is thought that issued premiums will amount to about USD 650 million (EUR 517.8 million), and as regards estimates for 2004, because of the delays in the launch projects, it is believed that this figure will be exceeded. There have, however, been years with much larger turnover, such as for example USD 1,104 million (EUR 879.47 million) in 2000 or USD 1,250 (EUR 995.78 million) in 1997. These notable differences are caused, partly, by the longer useful life and capacity of the new satellites, which enjoy sometimes a life in excess of 15 years as against 10 in the previous decade, which indicates a greater value at risk. Another cause influencing the above variations is the difference in capacity of the new satellites. Previously satellites operated with a payload of five to ten transponders (repeaters), and now the figure is from 60 to 70. With further regard to the differences, previously each transponder transmitted only one television channel, and now, thanks to digital compression, each one can transmit the signal of between 8 and 12 channels. As for the capacity that the space insurance market

offers for covering the life of satellites in orbit, this is thought to be between USD 200 million (EUR 159.32 million) and USD 250 million (EUR 199.15 million) per satellite. It is difficult to find greater capacity.

***When did the Spanish insurance industry and companies begin to participate in the satellite market?***

***What is the origin of Hispasat and how did it develop?***

In Spain, almost from the time when telecommunication satellite launches began some companies, such as Telefónica and Construcciones Aeronáuticas (CASA), displayed interest in taking part in this market in some form, whether as operator or constructor, which was clearly noticeable when the launch of European satellites began. The big leap forward, however, took place in 1989, when Hispasat was established. From then on Spanish companies began to construct different satellite parts, in accordance with the stipulations of the contracts signed with international constructors of satellites and shuttles. The launch of the first Spanish satellite, *Hispasat 1A*, which has been out of action since September of last year, took place on 11 September 1992. This was followed in July 1993 by *Hispasat 1B*, a twin satellite of its predecessor, which gave service on both the Ku waveband for civil use, and on waveband X, which is for military use. In February 2000 *Hispasat 1C* was put into orbit and in September 2002, *Hispasat 1D*. During these years there have been changes in the agreements with the construction companies and the satellite shuttles. Spanish industry has worked on all of them, through companies such as INDRA, INTA and CASA, which are now integrated into the European consortium, EADS, etc.



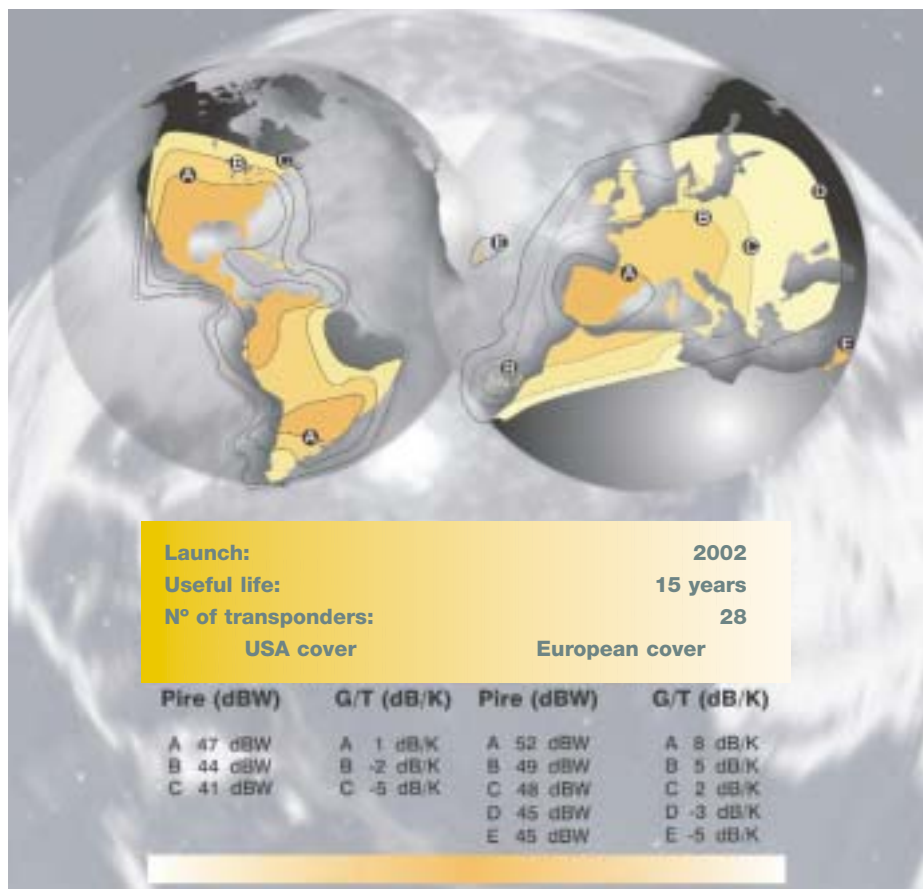
Lift-off from Cape Canaveral, Florida, USA of the shuttle carrying the *Hispasat 1D* satellite, which was put into orbit in September 2002.

Amongst the forthcoming launches that Hispasat and its affiliated and subsidiary companies plan to carry out is the communications satellite Amazonas, which is to be launched in the first half of July this year from the base at Baikonour, in Kazakstan. The range of its broadcasts will cover practically the whole of America and Western Europe and it will use the Ku and the C wavebands. The launch of *XTAR-EUR*, in which Hisdesat is a participant (HISPASAT has stock participation in this company), is also scheduled for the first half of this year, and in 2005, it is the turn of *SPAINSAT*, owned by Hisdesat, which will be the first Spanish satellite for exclusively military use. The date for the launch of *Hispasat 1E* has still to be announced.

***The insurance industry is of course working closely with these projects. With a view to future launches, is it possible to specify how it is proceeding to draw up an insurance***



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Broadcasting range of the Hispasat 1D satellite: part of America and almost all of Europe.

### **programme, for example, for a satellite such as Amazonas?**

The preparation of the insurance programme for the Latin American satellite *Amazonas* has developed in an interesting manner. Legal ownership is wholly vested in Hispasat Canarias. The estimated useful life of the satellite is 15 years. It will be located in an orbital position of 61° West and will cover the entire American continent and Europe. It will have 51 transponders and will distribute signals for radio and television, digital TV, business networks, multimedia services, and high speed Internet and will also be used for telephone and other types of links. On the subject of the insurance programme, in June 2003 the brokers were chosen. For three months in

the summer of 2003 study and analysis of the risks was carried out. After the technical presentation last September in the EADS-Astrium factory in Toulouse, market contacts began; in December the risk was submitted to the market and in January the process of quoting for reinsurance slips commenced. In February and March the terms of the policy were negotiated so as to proceed, once signed, to payment of the premium in two stages, with 95% payable 30 days prior to the launch, which is scheduled for July.

### **What risk prevention policy is Hispasat following for its satellites?**

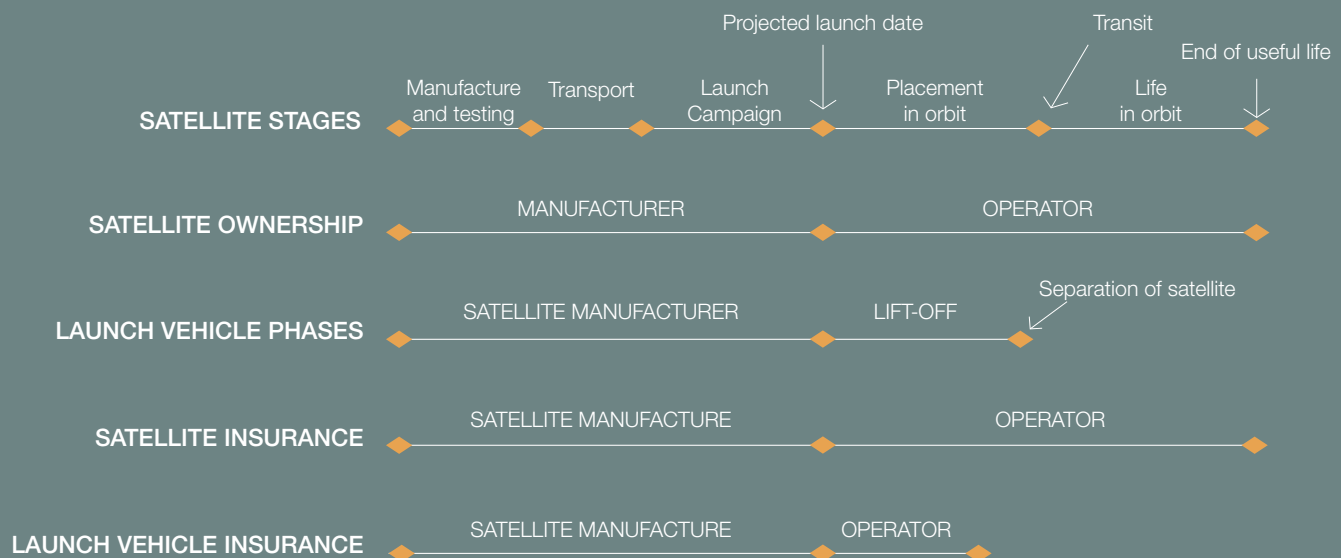
Irrespective of measures of risk prevention and control in the earth sector – such as

satellite control centres – which are normal for a strategically sophisticated communications system, Hispasat, throughout the entire construction programme of its satellites, has always exercised, and continues to exercise, close control of risk. The company usually stations its own engineers in the principal contractor's factory in order to take part in and monitor the construction process, together with the assembly and testing of the various pieces of equipment for the satellite, thereby exercising a true policy of risk prevention in each of the satellites for which it is responsible. This procedure is of course reflected in the terms and conditions which Hispasat obtains from the insurance market.

### **How does the Spanish insurance industry participate in the satellite market and what has been the experience gained as a result of the Hispasat programme?**

At first Spanish insurers did not participate directly in covering satellite operators, because there was no national operator. Only Telefónica was a signatory to the Eutelsat, Intelsat and Inmarsat projects and held a portion of the «ownership» of these bodies. In the international division of Telefónica there was a department of considerable technical importance devoted to satellites, in view of the company's presence in locations of Spain intended to transmit and receive satellite signals, such as Buitrago de Lozoya, Armuña de Tajuña, Barcelona, Canary Islands, Carmona, etc. Possibly, in times gone by, a Spanish insurer or reinsurer might have taken a small share in the international retrocessions, but this type of insurance really took off in Spain in 1990, when construction of the first Hispasat satellite began. Shareholders were sought who were directly involved in insurance and

## Diagram of insurance for launch vehicle and satellite



risk management. Three members nominated their affiliates, Postal Seguros Generales, Musini (INI) and Telefónica's Risk Management and Insurance department, together with its reinsurer, Casiopea Re. A working party was formed to study the risks of launching satellites for the *Hispasat 1A* and *1B* programme, in conjunction with experts from large international brokerage houses.

### Who participates in the insurance of satellites?

It should be noted that this is a specialist market in which clients and brokers operate as well as insurers and reinsurers, and where all participants are leading names. Amongst the clients are the satellite operators, the companies that construct the satellites or shuttles and the countries from which the satellites are launched. The theoretical maximum

capacity is USD 643 million (EUR 512.23 million), but the real figure for each launch is USD 350 million (EUR 278.82 million), and for life in orbit up to USD 250 million (EUR 199.15 million).

### What type of claims can occur and what action is required?

General claims must be made within a period of 30 days. Once reported, there is a further 180 days to submit Proof of Loss. Claims may be of varying types. As an example, during launch, faults may occur in the shuttle in each of the stages until the satellite emerges from its capsule and is placed in transfer orbit, so that later, from Earth, it is possible to give instructions to put it into its final orbit position (GEO) by means of small thrusts of the booster engine. A fault in the post-separation phase may be due to its not being placed into transfer orbit, or even

perhaps, to a fault in the satellite at the moment of separation from the rocket, which impedes it from being put into geostationary orbit. A number of problems may arise at this stage, such as failure of the apogee engine, failure to deploy antennae and solar arrays, and failure of TT&C (Telemetry and Remote Control). During transit and its life in orbit, there may be difficulties with the solar arrays, with power, with the transponders and on-board computers, or with the batteries or because of excessive fuel consumption, etc. There are many reasons for a total or partial loss of a satellite or the tasks that have been assigned to it. Fortunately, this is not common and most satellites survive until the end of their useful life. ■