

# ESCCON 2011 - European Space Components Conference Estec

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#### **Barlow Lyde & Gilbert**

- Law firm with 870 staff with offices in London, Hong Kong, Shanghai, Singapore and Sao Paulo.
- Established in 1841. Has had specialist aerospace department since mid 1970's
- Space insurance expertise and experience:
  - Insurance policy drafting/advice
  - Insurance claims handling
  - Arbitration/litigation
  - contract reviews/drafting



#### **Relevance of Insurance**

- Insurance, finance and legal services are essential pillars of support for many new, space-based commercial applications
- Reliability of components is an important risk factor which could impact on performance or lead to failures resulting in insurance claims
- Space insurance is mainly taken for commercial projects and institutional customers are generally not so inclined to insure their missions but there have been many exceptions for ESA and even military programmes



# Why Insurance is so Important

- In the period1998-2007, nearly 100 insured spacecraft encountered failures, partial or total, leading to insurance indemnity.
- Total asset valued destroyed = \$7.5B of which 2/3 was due to satellite failures and 1/3 launch vehicles. (50%due to launch or early operation)
- For operators, billons lost in revenues due to the delay for replacement



# **Links to Previous Insurance Workshops**

- Workshop in Estec in April 2008 on "Technical Issues Relating To Space Insurance and Finance". Involved satellite Operators, Agencies, Manufacturers, Insurers and Brokers. Speakers included ESA Director of Telecommunications, Head of ESA Navigation Department and Head of ESA Product Assurance and Safety Department.
- Follow-up in separate Workshop at Pagnanelli Insurance Conference in Venice in April 2009

Why no ESSCON since 2002?



# Some History relating to European Component Supplies

- Mid 1960s- Intelsat 4 programme Hughes the US Prime Contractor supplied all space-qualified parts and materials to European subsystem contractors
- Early 1990s, Euroconsult study for ESA of equipment and components- reported that 60% of communication payload components came from Japan and many other parts for payloads and bus came from U.S.
- Present situation have things significantly improved? Some differences of opinion on reported figures but nevertheless the extent of European coverage remains very disappointing



# **Policy To Develop European Sources**

- Has been the ESA policy for more than thirty years. Often re-stated
- E.U. Space Policy 2007. Space declared to be of strategic importance
- Even if there are the necessary investments in development of European components, a major problem is cost of producing components and level of potential sales to permit manufacturers to be profitable and competitive
- Consequently, many EEE components are still procured from non-European sources (50-60%?).
- Realistically, European investments in new components are likely to be limited to those identified as being critical/of strategic importance or which offer good prospects of sales

Does it matter? It does to insurers, particularly because of transparency issues.



#### **Fundamentals of Insurance**

- Transfer of financial risk in return for a premium payable at attachment of risk. Premium of many pays for losses of a few.
- Relationship should be based on transparency, confidence and trust
- Insured and insurer have a mutual interest in achieving good performance of the item insured - but the manufacturer has additional pressures of commercial competition, schedule and cost.
- Insured must make full disclosure of all material facts to comply with insurance policy conditions (and also of any subsequent material change in level of risk)
- Not simply a question of "Is it insured" can be wide variations in coverage e.g. the insured value, insurance of second failure only, excess (deductible) levels, exclusions (can be specific technical risks).
- Subrogation Insurer can pursue manufacturers in case of loss if there is no waiver of subrogation rights and no "hold harmless" provision



# Some Issues For Insurers (1)

- Adequacy of provision of information to permit thorough risk assessment
- Subsequent changes not notified to the insurer which may increase the risk and can lead to problems:
  - Changes notified in good time could lead to an increase in premium, excess level, or an exclusion relating to a specific risk
  - Changes not notified can give rise to disputes in case of failure
- heritage
- Minor modifications of working designs or processes may receive less attention than new equipment



# Some Issues for Insurers (2)

- New technologies/designs/processes Increasingly, new technology being introduced on commercial programmes. (ESA technology demonstration missions have tended to be large, complex and infrequent. New trend for smaller missions e.g. PROBA, GIOVE, but there are few technology demonstration missions as such)
- Long-term partnerships, confidence in product assurance processes
- change of manufacturing facilities, new personnel
- Insufficient margins (fuel, power)
- Single-point failures. (Insurers like redundancy)
- Random parts failures



#### **Some Issues For Insurers (3)**

- Transparency: when anomalies occur visibility is often limited:
  - Equipment black boxes
  - ITAR restrictions
  - Commercial sensitivity
  - In-orbit failures not leading to commercial losses or insurance claims tend not to be reported
  - Security aspects on military programmes/hosted payloads
- Problems on one spacecraft may have implications for other spacecraft of the same series or for other spacecraft incorporating the same design and/or components

A new culture needs to be established with respect to transparency. Could be more communication/exchange of data



#### **Assessment of Risk**

- Insurers now have relatively good technical capabilities and databases about spacecraft failures on a global basis with information supplied from a wide variety of sources
- Disclosures through briefings, review documentation, lists of qualification status and other documents – tend to focus on heritage and new elements - remains an imperfect process. Insurers rely heavily on what they are told, on past history and experience and on the professionalism and integrity of their clients
- Insured has an obligation to disclose to insurers material risks and changes. Has important implications for terms of the insurance coverage and the settlement of claims. Need for notification of changes to insurers is sometimes often overlooked



#### **Welcome Initiatives**

- The ESA ARTES programme ad –hoc forms of PPPs aiming at operational systems – ESA supporting new technology developments up to in-orbit qualification and validation (also share of launch and of system integration costs..)
- ESA General Support Technology Programme (GSTP)
- ECSS- the establishment and application of European space standards.
- Proposed ESA Product Catalogue\*
- Proposed ESA Equipment Qualification Status List (ESQL)\*

\* Presented by ESA at the Workshop in ESTEC in April 2008 and at Venice in April 2009. Insurers asked to support the creation of the EQSL and the Product Catalogue.



#### **European Space Product Catalogue** (ESA presentation April 2008)

• "Indicating European products that are listed as having followed:

- Part of a development programme (e.g. BBM/EM) or
- In the process of a qualification programme without having achieved full EQSL rating(e.g. EQM w/o life testing completed) or
- Low cost/high risk mission with limited years of in-orbit heritage
- Product Catalogue data sheets will indicate the level of test programme and provide a level of configuration control
- End-user will need to complete the qualification for flight or extend qualification to cover his project application"



# Certification & Equipment Qualification Status List (ESA presentation April 2008)

- "Equipment Qualification Status Review (EQSL) process primarily intended to check suitability of equipment already flown on heritage programme for suitability on new user programmes
- Establishes the level of design and as-built maturity in ECSS terms i.e. class A,B,C&D and model philosophy (BBM,EM,EQM,QM,PFM,FM)
- Cross correlation with NASA TRL terminology if needed
- EQSL rating implies equipment has gone through complete qualification programme with frozen as- built configuration; considered fully qualified with no retest or only minor retest for reflight on new user project"



#### Conclusions

- Need to consider issue of new European sources of supply for components and how to increase present levels
- Importance of concepts of disclosure and transparency for insurers. Need for a new culture to ensure adequate level of transparency. The insured has to be aware of its obligations to insurers. Could be more general exchange of data between interested parties –better communications
- Insurers welcome initiatives with respect to ESA technology development programmes such as ARTES and the GSTP, European standards (ECSS), and the proposed ESA Product Catalogue and ESQL (What is current status of these proposals?)

Component experts should organise conferences more frequently