Space Liability & Insurance

Space Law Certificate Course 2017

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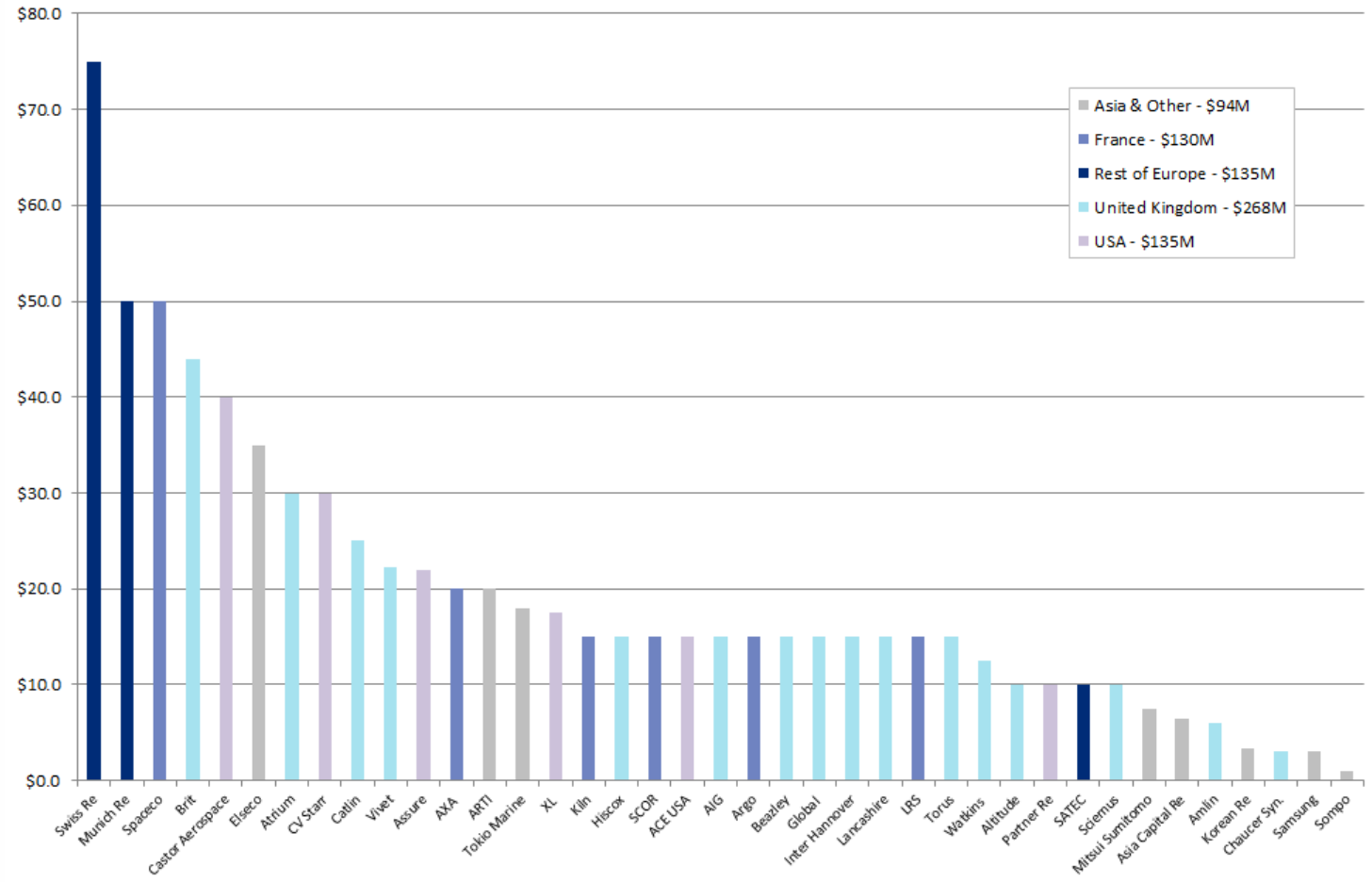
Space Insurance

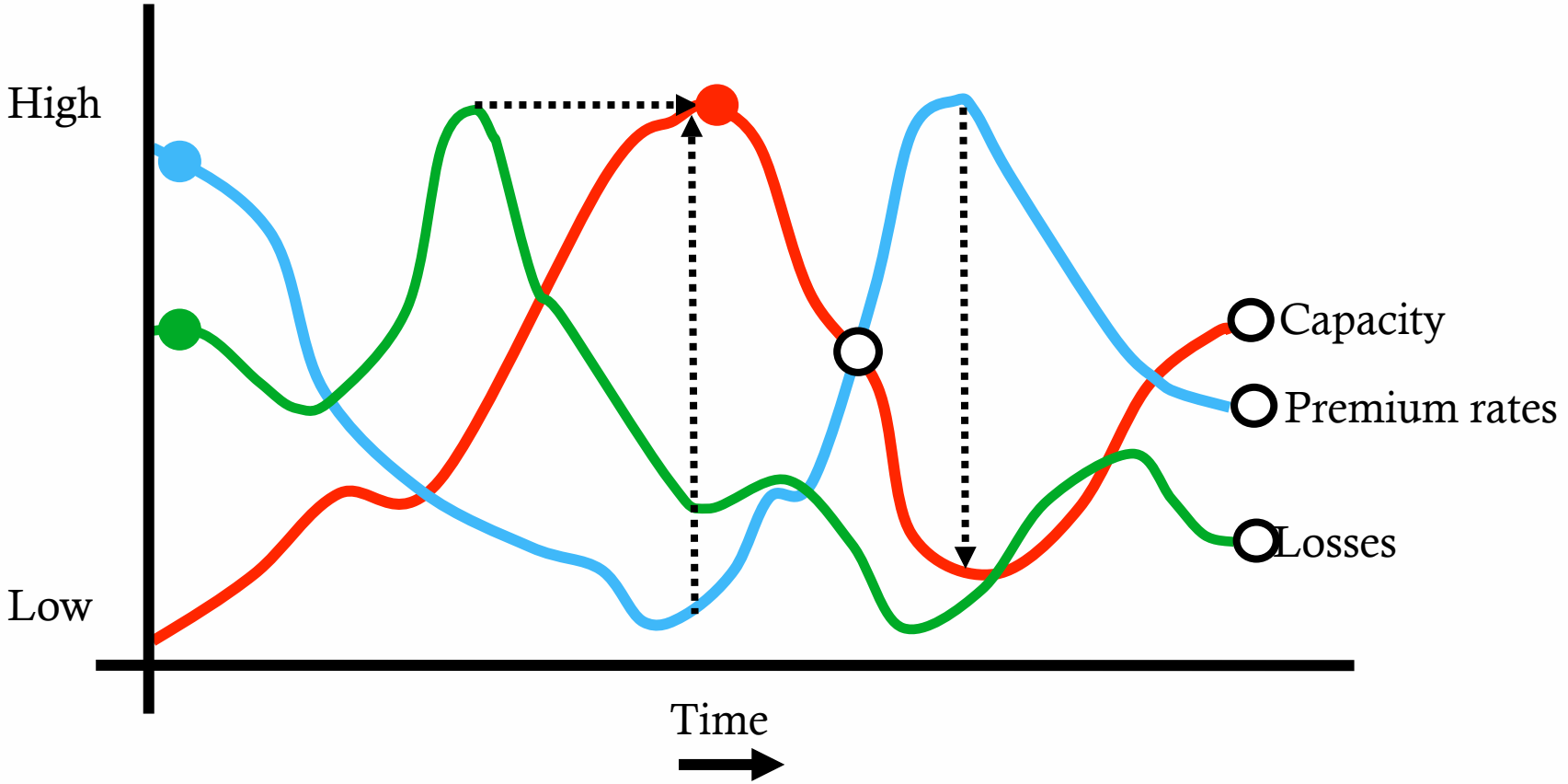
What is Capacity?

- Insurer's capacity is the amount or limit that an insurer is able to offer for any one risk
- Market capacity is the accumulation of all insurer's capacity
- Distinguish between
  - Theoretical capacity which is what an insurer claims to have available
  - Actual capacity what an insurer will offer for a very good risk

Space Insurance Capacity

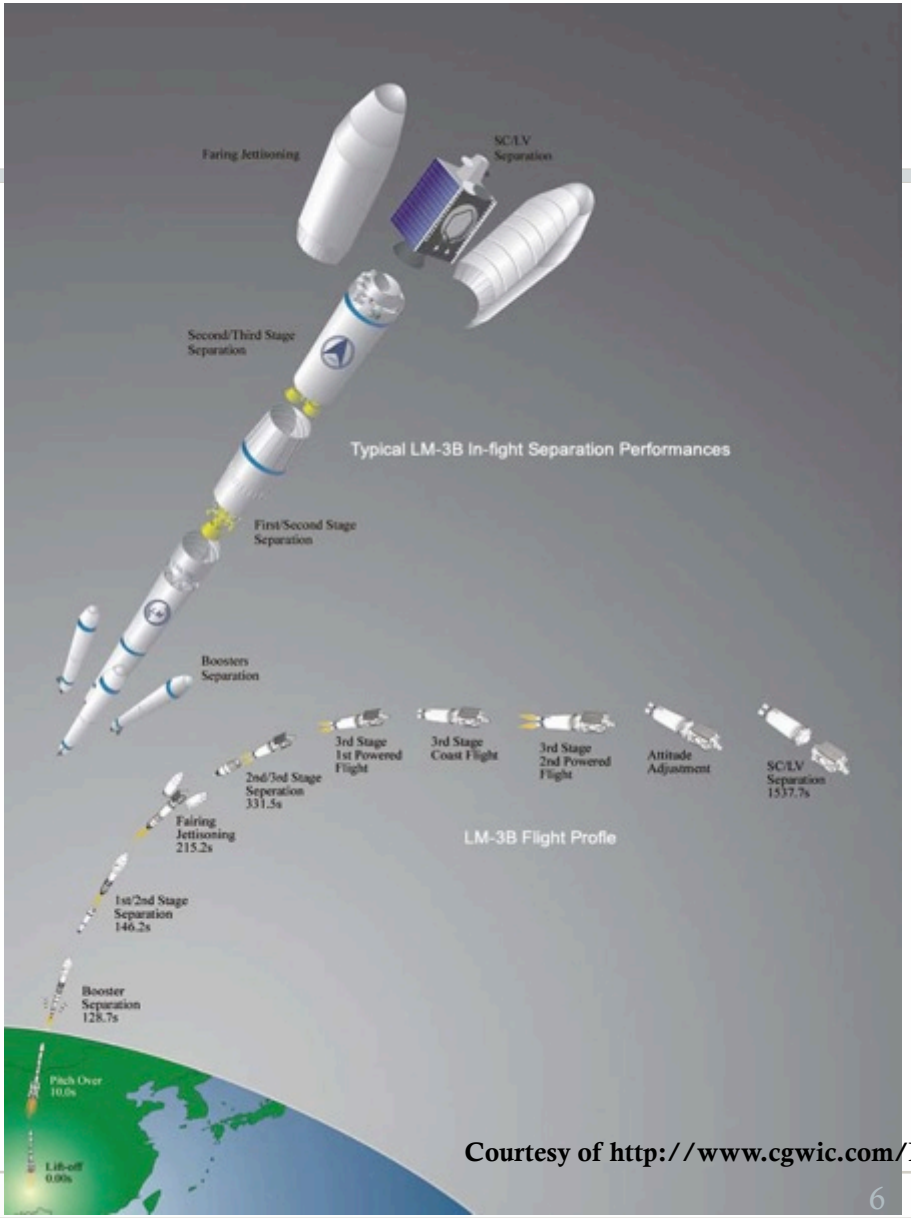


Relationship Between Capacity, Losses and Premium Rates



Launch Insurance

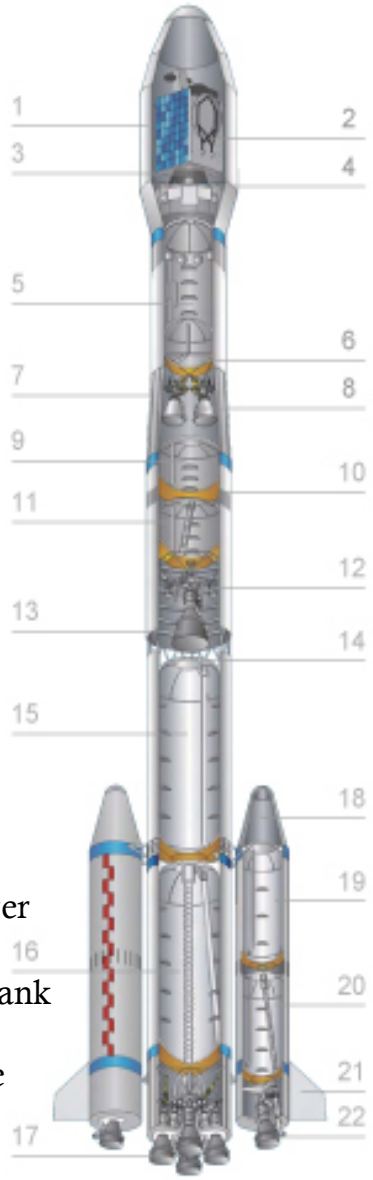
Launch Sequence



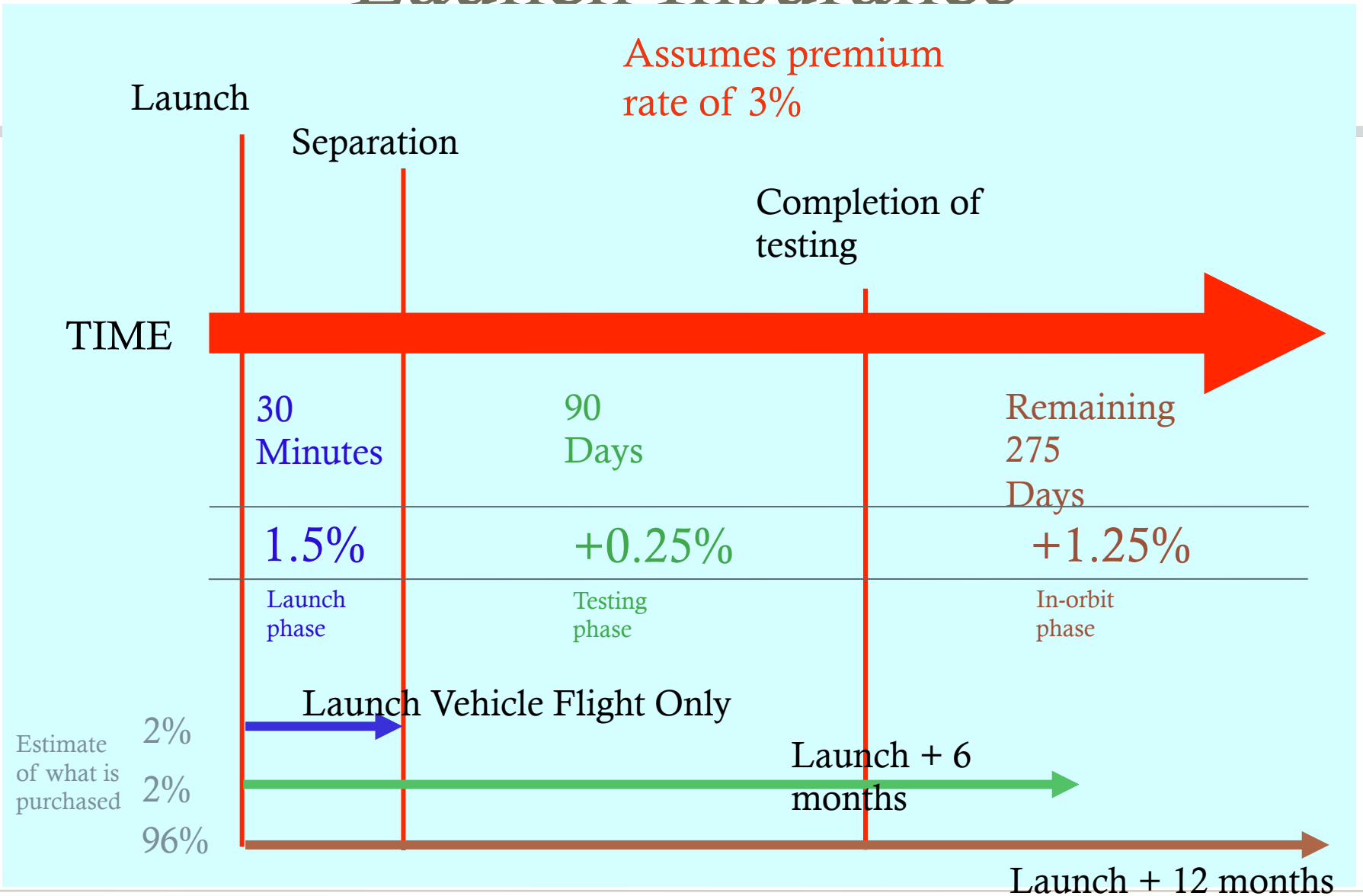
Courtesy of http://www.cgwic.com/LaunchServices/LaunchVehicle/I

Long March 3B

1. Payload Faring
2. Payload
3. Payload Adapter
4. Vehicle Equipment Bay
5. LH2 Tank
6. LOX Tank
7. Inter-stage Section
8. Third Stage Engine
9. Oxidizer Tank
10. Inter-tank Section
11. Fuel Tank
12. Second Stage Vernier Engine
13. Second Stage Engine
14. Inter-stage Truss
15. Oxidizer Tank
16. Fuel Tank
17. First Stage Engine
18. Strap-on Booster Cone
19. Strap-on Booster Oxidizer Tank
20. Strap-on Booster Fuel Tank
21. Stabilizer
22. Strap-on Booster Engine



Launch Insurance



Launchers

- Main launch vehicles:
  - Ariane 5
    - Vega
    - Soyuz
  - Proton
  - Sea Launch
  - Falcon 9
  - Long March 3B

In-Orbit Insurance

In-Orbit Cover

- Wording negotiations tend to be concise compared to protracted launch insurance negotiations
- Insurers of the launch programme tend to be approached first
- Rates are presently in the region of 0.25 – 1.3% for 12 months cover
- Insurance Capacity is high which is causing rates to fall

In-Orbit Cover Drafting Considerations

- Follow the same wording as used for the launch insurance but remove the "launch" references removed
- Basis of cover is the same

$$1 - \left(\frac{\text{Available Communications Capacity}}{\text{Stated Communications Capacity}} \right) \text{X} \quad \text{Amount of Insurance}$$

- Calculation based on available transponder years
- Transponder years based on original life and remaining satellite life

Third Party Liability Insurance

Third Party Liability Insurance

- Basis of cover is to protect insured parties from liability for damage caused by space related activities
- Risk of loss attaches at INTENTIONAL IGNITION and terminates after a specified period (usually 12 months)
- Cover is for the consequences of an occurrence, typically "to indemnify the Insured for all sums that it becomes legally obligated to pay due to an occurrence that causes personal injury or property damage to any third party"
- Cost is relatively cheap (0.1%) because there are relatively few accidents
- Launch service providers offer under the launch service agreement

Third Party Liability Insurance

- Launch service providers need the cover in any event so offering it as an additional benefit under the launch services agreement serves 2 interests
  - Launch service provider has control over the contract, which means it can tailor cover to suit its requirements
  - Launch service provider gets a contribution towards the insurance costs through launch service price
- Launch service providers provide different limits
  - Arianespace EUR64m
  - Proton USD100m
  - Sea Launch USD100m
- Problem arises when state issuing the launch license requires a higher limit than launch service provider

Accidents

Space Weather and Radiation

- Covered under a standard launch policy
- Solar flares may affect components
  - Satellites are built to withstand
  - Galaxy 15 ('ZombieSat') affected by flare on 5 April 2015
  - Came back on line 23 December 2015

Collisions in Space

- Geostationary orbit
  - All in the same direction
- Low Earth Orbit
  - Iridium 33 / Cosmos 2251
  - https://www.youtube.com/watch?v=_o7EKlqCE20
  - Collisions with foreign bodies
  - JAXA Hitomi satellite

Debris

- Ongoing problem
  - Bigger problem in LEO
  - Cascading effect
    - Prevent all launch activity
- What to do?
  - Capture and de-orbit
  - Vaporise
  - More control?
  - https://www.youtube.com/watch?v=tN_CvGJKMOs

Accidents Involving Expendable Launch Vehicles

- Re-contact events are covered
  - Should be limited to immediate events
  - Cover for damage to the satellite
- Most incidents are on the ground
  - Cover for damage caused by the launch vehicle

Interference with Satellite Signals

- Jamming
  - Not covered under asset policy
  - Covered under a loss of revenue policy
- Cyber attack is a grey area
  - Damage could be covered
    - Terrorist attack would be excluded
    - State attack probably excluded
    - Hacker not specifically excluded