Development of Laws and Regulations for Range Safety, Flight Safety, and Accident Investigation in the Era of Commercial Passenger Spaceflight

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Commercial Passenger Spaceflight

• Assumptions in relation to the evolution of the commercial passenger spaceflight industry
  • Birth of the commercial passenger spaceflight industry is imminent
  • Service would begin as novelty flights marketed (erroneously) as “space tourism”
  • Passenger service would become scheduled point-to-point travel between cities on Earth
  • Eventually, spacecraft would ferry humans between the Earth, Earth orbit or the Moon
Why Be Proactive?

- Why not the “fly-crash-fix-fly” approach?
  - Space industry is multinational in nature and so there is a need for international action
  - Modern society is far more litigious than the 1930s at the beginning of civil aviation
  - Civilisation needs to evolve over time – we must learn from past mistakes
Industry Requirements

• Essential elements for a spaceflight industry
  • Jurisdiction and control
  • Rescue and recovery obligations
  • Liability
  • Formulation and enforcement of safety standards, regulations and procedures
  • Range safety regulations to ensure safety at spaceports and security of operations
  • Accident investigation procedures
  • Implementation, audit and enforcement
Jurisdiction and Control

• Article VIII of the Outer Space Treaty
  • If on Earth, territorial jurisdiction would prevail over jurisdiction of the State of registry
  • In outer space, the State of registry maintains jurisdiction and control over a space object
Rescue and Recovery

• Rescue Agreement
  • (also article V of the Outer Space Treaty)
  • Must announce any knowledge of accident, distress or emergency involving a spacecraft and specifically notify the launching authority and the United Nations
• Must rescue, assist and return personnel after emergency landing within State territory
• Must rescue and assist in search and rescue after emergency ditching in the high seas
Third Party Liability

- Liability Convention
  - (also article VII of the Outer Space Treaty)
  - Concept of “launching States” for each spacecraft
  - Absolute liability for damage caused to the surface of the Earth and to aircraft in flight
  - Fault liability for damage caused in outer space
  - Applies only to third party liability and only where more than one State is involved – does not have domestic application without legislation
Passenger Liability

• Article VI of the Outer Space Treaty
  • States bear international responsibility for their space activities and those of their private persons or entities
  • If passengers are from a different State to the State of the operator, then article VI may apply
  • No application if passengers are of the same State as the State of the operator
  • No limit as to liability as under Warsaw Convention
  • For novelty “space tourism” flights, can be limited or excluded by contractual clauses
Flight Safety

• International standards require uniform and universal application and enforcement, or there would be the “flag of convenience” problem

• Maritime safety rules developed in modular form with different topics covered by different IMO treaties, e.g. SOLAS Convention

• Standards and rules developed by ICAO form a comprehensive safety regime for civil aviation under the Chicago Convention framework
Suggestion

A broad treaty with implementation and enforcement principles / mechanisms like the Chicago Convention

The first annex to be developed ought to be similar to the SOLAS Convention

Other areas of flight safety, such as the other annexes of the Chicago Convention, can be adapted to passenger spaceflight
Range Safety and Security

- *Space Activities Act 1998* (Australia)
  - Requirement to appoint a “launch safety officer” responsible for ensuring compliance with standards and regulations, and to ensure range safety
  - Give notice to the public for launches and to ensure airspace clearance
  - Seize evidence in relation to accidents
- Later, adapting civil aviation treaties dealing with criminal acts, hijacking and terrorism
Accident Investigations

- Chicago Convention, Annex 13; and the ICAO Manual of Aircraft Accident Investigation
  - Conduct of investigations
  - Rights of other relevant States to participate in the investigation
  - Template for Final Reports
<table>
<thead>
<tr>
<th>AREA</th>
<th>SOURCE</th>
<th>MATTERS FOR ADAPTATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jurisdiction</td>
<td>Space Law</td>
<td>Outer Space Treaty, article VIII</td>
</tr>
<tr>
<td>Distress and Rescue</td>
<td>Space Law</td>
<td>Rescue Agreement; Outer Space Treaty</td>
</tr>
<tr>
<td>Third Party Liability</td>
<td>Space Law</td>
<td>Liability Convention; Outer Space Treaty</td>
</tr>
<tr>
<td>Flight Safety</td>
<td>Maritime Law</td>
<td>SOLAS Convention for the safeguarding of safety and welfare of lives onboard</td>
</tr>
<tr>
<td></td>
<td>Aviation Law</td>
<td>Chicago Convention and SARPS</td>
</tr>
<tr>
<td>Range Safety</td>
<td>Domestic Space Law (Australia)</td>
<td>Range safety requirements</td>
</tr>
<tr>
<td></td>
<td>Aviation Law</td>
<td>Tokyo &amp; Hague Conventions, etc</td>
</tr>
<tr>
<td>Accident Investigation</td>
<td>Aviation Law</td>
<td>Chicago Convention, Annex 13</td>
</tr>
</tbody>
</table>
Thank You

For a copy of the paper, please email me!

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