SPACE POLICY AND LAW COURSE 2019

INTERNATIONAL CO-OPERATION CASE STUDY

ALL EXAMPLES ARE TRUE

CASE STUDY 1:

FROM SPACE STATION FREEDOM TO THE INTERNATIONAL SPACE STATION

Space Station Freedom, initiated by President Reagan, had four partners: the USA, ESA, Japan and Canada. The contribution of ESA to Space Station Freedom was a "four-segment" Columbus Laboratory.

In 1992, when the Freedom and the Mir2 Stations were merged into the International Space Station, adding Russia, ESA had to reduce Columbus to a "two-segment" laboratory.

a. ***Why?***
b. ***What were the consequences for ESA?***

CASE STUDY 2:

LAUNCHING SOYUZ FROM THE SPACEPORT IN FRENCH GUIANA (CENTRE SPATIAL GYANAIS, "CSG")

In 2008, ESA Member States decided to invest in a Soyuz launch pad at CSG to operate Soyuz from French Guiana. The first launch in 2011 had the first two Galileo satellites on-board.

Beyond the political aspects, the cooperation between ESA and Russia was based on mutual interest:

- For ESA, complementing the range of launch services offered by the operator Arianespace, between the "heavy" Ariane 5 and the "small" Vega;

- For Russia, having access to an equatorial base.

The mutual interest was relying upon the assumption that the launch pad and the launcher were identical to the ones set and launched from Baikonur and Plesetsk.

However,

- The launch facility in CSG includes a mobile "gantry" but not in Baikonur nor in Plesetsk;

- The launcher includes an additional safety box specific to the vehicles launched from CSG;

- The business plan of Soyuz at CSG is totally different from the one planned at the origin;

- The exploitation of Soyuz at CSG is nevertheless a success.

a. ***Why?***

INTERNATIONAL CO-OPERATION CASE STUDY

SOLUTIONS & DISCUSSION POINTS

CASE STUDY 1:

The problem to be solved for merging SSF and Mir 2 into ISS was the choice of the orbit. SSF was on an orbit inclined at 28°, corresponding to the latitude of Cape Canaveral where the US Space Shuttle was launched, and Mir was on an orbit inclined at 51°, corresponding to the latitude of Baikonur where the Proton and Soyuz were launched.

The choice was to place ISS on a 51° orbit to preserve the capability of Soyuz to resupply the ISS. By making that choice, the Space Shuttle lost a significant part of its payload capacity into that new orbit. Consequently, ESA had to reduce the size of its laboratory by a factor of 2.

The consequences for ESA were:

1. A redesign of the laboratory;
2. Delays: Columbus was launched in 2008, while the original calendar (for Station Freedom) was 1992 (named "Columbus" to mark 500 years of "landing" in America);
3. Extra-costs.

The ISS success is a unique symbol of international cooperation, and the choice of the 51° orbit has contributed to the success after the accident of "Columbia" and the retirement of the Space Shuttle.

CASE STUDY 2:

The changes that had to be introduced are due to several different factors:

1. The mobile "gantry" added to the launch facility was introduced to take into account the different weather conditions in French Guiana, compared to Baikonur and Plesetsk.

2. The "safety box" added to the launcher was to comply with the French responsibility as a launching State. This "safety box" gives the French authorities the capacity to act on the launcher independently from the normal operations of the vehicle that are under teams' Russian control.

3. The Soyuz business plan was originally for launch of geostationary satellites, the CSG being ideally placed for launching satellites to geostationary orbit. From CSG, Soyuz increases its performance to geostationary orbit by 50% as compared to Baikonur (3 tons to GTO compared to 2 tons).

4. During the construction of the launch base at CSG (from 2003 to 2011), the market of geostationary satellites has significantly decreased and it continues to do so. Fortunately, new markets have emerged during the same period, in particular the two constellations Galileo and Copernicus developed under the EU auspices. The exploitation of Soyuz at CSG has moved from the original commercial market of telecommunications to the current institutional market of navigation and Earth observation. Thus, in the end, a great success for Soyuz at CSG and a chance for European institutional satellites to be launched from a European launch base!