



## We Hear From

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Anil Kumar Ghosh

### Space Taxi for Journey to the Moon

The NASA of USA has for the first time permitted foreign development partner for the space ship Orion. Two rivals, both of them the biggest space journey concerns of the world had to learn to work in cooperation.

Europe comes closer to the moon symbolically in small steps. Engineers of space journey section in airbus concern developed in Bremen a module for spaceship Orion on the requisition of European Space Agency ESA. In November 2015 the first hardware, a structural model of module was shipped in the USA Federal State Ohio from Turin. There it is now in Glenn Space Centre of NASA thoroughly tested.

Orion, the joint project of NASA and ESA is a space ship by means of which the astronauts could break open the other side of the earth's orbit in space. Europe supplies the ESM (European Service Module) which provides energy for the moving force as also contains the storage for drinking water and air-pressure. In future Orion will transport human-being to the moon and the mars. Now and then the cooperation is questioned – between NASA and Lockheed Martin on one side and on the other side of the Atlantic ESA and Airbus Defense and Space. Before all the cooperation of both the concerns is unusual. As number 182 they compete very often in tenders. Originally Lockheed Martin alone should have developed Orion but then on

the instruction from NASA it had to drawback. For the first time the Europeans supply a critical component for a central NASA design.

Why have the USA decided on such as intensive cooperation with a foreign partner the ESM project manager Oliver Juckenhofel can explain. "It is also not simple for a big agent to give up to others what I have in day-to-day business made uptil now" says the Airbus developer. With NASA it is but a process of change of thought in order to know. The agent works always in cooperation frequently with industrial partners as for example with the supply to International Space Station (ISS).

Lastly I have asked NASA "Why should we develop one capability which the others already have?" "That the ESA and airbus as industrial partner which possesses the necessary competencies for the ESM (European Service Module) we have with ATV arranged under demonstration" says Juchkenhoefel. By Airbus developed Orion-module strongly depends on this automatic transport vehicle which has reinforced supply to the ISS five times.

The service module ESM does not hold any self-developed driving force rather shuttle programmes used one. The integration of the driving force shows the complexity of cooperation. Enormous quantity of questions according to Juecken has come up. The simplest

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ones are as per geometrical section. Where must I place the pipe system? Where are delivery points? Nevertheless it is distinctly more difficult". Upto which weight the welds are suitable in the propeller? How do the Americans qualify at all with their welded seams?"

The answers to these questions were disillusioned and encouraging at the same time disenchanting while the Americans do not allow looking into the map and making arguments with confidence of information. Encouragingly while the engineers step by step develop trust with each other. At the end now exists strong friendship says Juckenhoefel.

A further speciality of the cooperation is exhibited always when the safety of the crew is concerned. After both the shuttle catastrophies, NASA has made an independent safety space experienced coworkers. These spaces get the position of the developments presented regularly. While the safety of astronauts is concerned, these spaces can address each contractual requirement – says Juckenhoeffel. According to the Airbus project manager, NASA and ESA succeeded with the spaceship Orion with diverse objectives. For the Americans

the central point is the stand, the way to the moon and perhaps later to the mars and for the Europeans it is for example technical details round about the landing.

Both the sides are in agreement but Orion is the pioneer for numerous future exploration missions. "Orion is for me the taxi to the moon" says Juckenhoefel. The question is: What do we do then? Will the next big project be a habitat where in the astronauts can stay there for longer period?

The answer could come in the conference of the competent ESA minister at the end of 2016, when the further goals of the European space journey will be fixed up. I make out of this that the Orion history will be written on – says Juckenhoefel. Then there the way would be free for a European participation to the first flight to the moon in 2020.

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