

MOON BASE

Why we can afford the moon base program?

Conditions and requirements of the stakeholders to start the Moon Base program

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The Moon Base program is a long-term inspirational program proposed by President George W. Bush in January 2004, oriented towards the exploration of the Solar System, with a return to the Moon as a first step, this time to stay.

The come-back to the Moon is part of an overall vision which will lead future missions to Mars, and beyond.

As told by Mr. Griffin, “the space program is a long-term investment in our future. We must deal with our short-term problems while not sacrificing our long-term investment in our future”.

The main goal of landing astronauts on the lunar surface is to prove that they can ‘live off the land’, using *in situ* resources to produce potable water and fuel, in view of a human expedition to Mars, where they will have to stay for longer periods.

THE FINMECCANICA’S POINT OF VIEW

At the present moment, no significant commercial revenues can be expected by private investors in the medium term from a mission to the Moon. Nevertheless, the program shows at least two dimensions highly promising for industry.

The first one deals with technology and system integration.

The program will make use of a wide spectrum of technologies and therefore several spin-offs can be reasonably expected. Unlike the case of the Apollo program, now we have the chance to manage high-tech relapses from the very beginning, instead of acknowledge

them afterwards. On this subject, the complete and diversified portfolio of Finmeccanica in the Aerospace & Defence will make quite easy to turn spin-offs into spin-ins for contiguous sectors.

System level requirements will also provide a good opportunity for industry to develop the capability to integrate and manage such a complex system, both under the engineering and the international cooperation point of views. The experience of the International Space Station could be profitably revised and improved.

The second aspect will give fruits in the farer future, but it is worth to be mentioned all the same. Staying on the Moon will allow several applications to be studied, experimented and eventually exploited.

For example, solar energy production on the Moon will be much more efficient than on the Earth and, as transfer problems will be solved (e.g. wireless energy transportation), it could represent a real asset to face the decreasing of terrestrial oil reserves.

Applications represent the major field of collaboration between users and industry and could provide unexpected opportunities.

As a matter of fact, there also exists a third dimension, which probably will not directly impact industry business plans, but which is of paramount relevance and will benefit both US and Europe. The Moon Base and, more generally, the Solar System exploration have an high strategic and cultural profile and could greatly help US and Europe to attract young researchers and engineers towards the space, helping them to answer the challenge posed by emerging Countries, like China and India, which are definitely developing their own space policies.

WHAT FINMECCANICA CAN OFFER TO THE PROGRAM

Italy has a long tradition in space activities: not only it was the third Nation, after USSR and US, to put in orbit a satellite, in 1964, but at the very beginning of the sixties Telespazio became the first commercial operator all over the world. Moreover, Italy holds some technological excellence, such as antennas, adaptive optics, particle detectors for

space, synthetic aperture radars, and developed the only solid-fuel stage qualified to fly on the Space Shuttle, the IRIS.

Within the Finmeccanica group do exist expertises and capabilities which can be fruitfully contributed to the exploration program and in view of the establishment of a base on the lunar surface. In particular:

- Alcatel Alenia Space is a world leader in crew & cargo transportation systems and in habitation & life support systems, and has deep expertise in advanced materials & structures, in operations & logistics and in navigation & telecommunication;
- Telespazio holds a strong tradition in mission planning, flight dynamics & operations, and can really contribute in personnel training, together with Datamat;
- Galileo Avionica (Selex SAS) stands amongst the major players in robotics systems & space-qualified sensors;
- Avio can give a valuable contribution in propulsion.

In term of integration and management of large systems, Finmeccanica can share its remarkable experience acquired participating in large European programs and consortia in the Aerospace & Defence sector, like Eurofighter, Galileo and Ariane.

Moreover, Finmeccanica has an outstanding record of cooperation with US companies for the development of complex programs: the F-104 Starfighter (Lockheed Martin, Raytheon), the Joint Strike Fighter (Lockheed Martin, Northrop Grumman), the MEADS program (Lockheed Martin), the NATO AGS system (General Dynamics, Northrop Grumman), the B-787 Dreamliner (Boeing), the C27J (Lockheed Martin, L-3), the US101 (Lockheed Martin, Bell Helicopters) and, finally, the still on-going competition for the Light Utility Helicopter (L-3).

In particular, concerning the NASA space exploration program, Finmeccanica has already established cooperation agreements with US industries, through Alcatel Alenia Space, for

the 'Human Lunar Exploration Architecture' study as well as for the 'Crew Exploration Vehicle - Phase 1' program.

WHAT FINMECCANICA REQUIRES TO PARTICIPATE TO THE PROGRAM

Finmeccanica has a strong interest in participating to this highly promising program with a well defined and properly rewarding profile.

In view of the lack of commercial revenues in the short and medium period and considering the need of huge investments in term of R&D activities, personnel and time, there are a few conditions precedent to the participation of Finmeccanica to the program.

First of all, we consider a key factor the set-up of an industrial organization with a clear definition of roles and responsibilities, according to the recognized leaderships in different sectors, which valorises the areas of excellence of Italian industry.

Secondly, it shall be defined and launched a sustainable program, with adequate synergisms amongst national, European, bilateral and multilateral preparatory activities, with a proper level of funding.

Moreover, it is extremely important that the transatlantic cooperation between Italy and US become immediately operational through the actual participation of the Italian industry to the Crew Exploration Vehicle development and via the establishment of a bilateral initiative related to Moon exploration.

Finally, due to their early involvement in the program, Italy and Italian industry aim to acquire and maintain a reference position with respect to new countries which will step in, also in order to facilitate and speed-up the enlargement of the consortium.