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IAI SEPAG REPORT Assessment of Italian Space Policy

by Jean-Pierre Darnis

Report based on a workshop organised by the IAI on May 27, 2004, but the views expressed in it do not necessarily represent those of the participants or of the sponsors

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Introduction : the IAI/ESA SEPAG workshop, a new initiative

Since the 1960's Italy has developed a substantial space sector, building upon structuring projects such as San Marco, Sirio and Italsat.

Today Italian space activities can be summarized in 4 main sectors, also described in the National Space Plan :

- _Launchers with the VEGA program
- _Earth Observation with the Cosmo-Skymed program
- _Telecommunications with the military Sicral program
- _Exploration through the Italian participation to the ISS program

The Italian space sector is facing a decisive moment. The primary Italian space actors have been reassessing their positions from industrial reorganisation and investment to the need for new programs. In that changing context, space exploration activities are being questioned.

In the context of the ESA SEPAG workshop activities and analysis, the Istituto Affari Internazionali (Rome) has deepened the scenarios for the future of space exploration and space policy in Italy.

The IAI/ESA SEPAG workshop took place in Rome the 27th of May 2004. As quoted in "La Repubblica" newspaper on the 31st of May, it was "...a chosen observatory to underline the problems regarding international cooperation in space, crucial ones to start and finance the research and exploration programs...".

The SEPAG workshop was an opportunity to deepen and cross-check scenario and visions for exploration and space policy from both the ESA SEPAG team, coordinated by Dott Bernhard Hufenbach, and Italian space community leaders.

The IAI team has taken into consideration representative opinions throughout the Italian space community. The analysis provided in this document is the genuine expertise work of IAI, and does not reflect the official position of the Italian administration.

Major statements

Italian Exploration and the USA

- A double-track position :
 - _Pro US Space Exploration Policy (*Industry, "Europe is not prepared to respond to the US exploration program, we are ready and we have answered..."*)
 - _Strong critic of existing cooperation with NASA (*Independent experts*)
- The Italian government has close ties with the US

- Good cooperation of the Italian university labs with their US colleagues (a long-time tradition, with university exchange programs easy to access)
- Pragmatic approach of Italian towards technology cooperation (“ ...also in cooperation scenarios we try to get the best value...” *Industry, Institutions*)

Italian space exploration and Europe

- Launching and access to space activities are now strongly linked to Europe. ELV (a company owned by Avio and ASI) clearly illustrates this trend. Also to be mentioned Italian research programs dealing with monitoring sensors for space vehicles and thermal protection (CIRA)
- Experts criticize the participation to NASA program (ISS downsizing and follow-up doubts), asking for European autonomous programs
- A call for long-term planning capacities for research investment, inside an improved European framework for research and exploration (*University, SME's*)
- A strong commitment from ASI for exploration within SEPAG initiative.

Main trend for Italian space activities : a push for applications

- Strong interest for applications (*Ministry of Research, Industry and ASI*), exploration is not the priority.
- Space is linked to Security (*Industry, Asi-Gmes, MoD*), and Defense institutions are willing to increase their space-based capacities, a need for Italy and Europe. «*Space is a defense dimension* » (*Industry, MoD, Experts*)
- Space is not a real priority for government; no budget increase.

Exploration : a budget issue ?

- The lack of budget for space activities produces a choice in favour of applications rather than exploration : “*Exploration is good but can we afford it ?*” (*Industry, Ministry of Foreign Affairs, Ministry of Research*).
- If Europe choose to maintain exploration activities, it has to be targeted, based on a selective approach.
- Europe might not be able to afford men flight and should concentrate on robot mission

Space Exploration, an identity for Europe ?

- Exploration is not perceived in Italy as a valid support for European identity
- Space in Italy is driven by a program approach, meaning no high-level political profile
- The industry plays a central role : if the main space company (Finmeccanica group) becomes more «European» (through a merger with other companies), then space activities will increase their value as an identity symbol.

Space Exploration in Italy : a R&D approach ?

- Space Exploration can be used to develop applications (*dual-use concept for exploration and applications, ASI, Institutions, University*)
- Exploration is supported by the R&D community, particularly important university research labs
- Exploration is linked to industrial interest for the development of space infrastructures (*Alenia Spazio know-how*)

A call for an European action in the Exploration field

- Better organisation of the research linked to exploration within an effective European framework
- Improvement of data-bases linked to Exploration
- A new management model for the transatlantic exploration programs. Transatlantic cooperation is needed but shall be organized with less dependency for the European partners (*ISS model not to be repeated*)

Italian space policy priorities

- Italian Space policy: no real political priority and fragmented decision-making

Space is not a top priority for the Italian government. Historically space has been developed by specific visionary personalities (Amaldi, Broglio), able to create a kind of “individual system” (for example the Broglio management of the San Marco project). Industrial interests then took over development of the “national satellite programs” (cf. below). The relatively recent creation of ASI (1988) under the authority of the Ministry of Research and the difficulties of delays and maintaining continuity that affects the “national space plans” clearly illustrate the relatively low political interest in space activities.

Moreover in Italy technological elites doesn't participate in the central administration or politics. This is different from France where battalions of engineers have high-level responsibilities within the central ministries, including Treasury, and can easily dialog about the main technological developments. This cultural difference also acts to lower the political priority of Space, as no technological vision is being generated by the central administrative and government bodies.

- Italian model for Space policy: a main national program, user-oriented

Since the launching of the Sirio telecommunication satellite program, Italy has developed an original model for its space policy : a main national satellite program user oriented and managed by Italian industry, and some smaller but significant research, development and exploration programs, often involving international cooperation.

Until 2007, the COSMO-SKYMED observation satellite program will be the backbone of the Italian space investments, with more than 1 billion Euro budget. This program, that has been placed within a framework agreement with the French constellation Pléiades, clearly illustrates the competencies and potential of the Italian space industry and the priority of the political and administration decision-makers for application, dual-use earth-observation.

Following the same logic that brought the Sirio-Italsat-Sicral telecommunication satellites, space technology developments are linked to the possibility of future applications and new markets. Yesterday Italian telecommunication satellites paved the way for television transmission and mobile phones; today an Italian earth observation constellation is seen as a basis for the development of new monitoring services in the “Mediterranean area”, the main area of interest.

- Industrial evolution and national space-policy

The two Alcatel Space-Finmeccanica joint-ventures are bringing the primary Italian space industries into a common framework with the French industry. With a minority share (Alenia Spazio 33%) of the space systems company, this agreement brings the satellite production industry into a bilateral framework. However the strong Italian predilection for “satellites program for future uses” will not vanish, as it is deeply anchored in institutions, but will eventually adapt itself through deeper international coordination in public investment and programs. The 66 % Telespazio share in the space services joint-venture confirms the priority given to the development of new services and markets.

- Launching technologies, a priority

In a complementary manner to this end-user approach based on satellites development, Italy has developed a significant launching and space flight activity.

The Italian small launcher Vega is now completely integrated within the ESA “access to space” program. Together with Ariane V and Soyouz, it will offer a large range of capacities. Vega is conceived as a system for uploading space structures and defines an important Italian capacity. Also the recent agreement between Italian Finmeccanica and EADS to create a joint-venture for future launchers programs (previsions : 30 % share to Finmeccanica) clearly indicates a growing investment in this area, while the ASI and Finmeccanica interests indicate the significant profile that Italy wants to play in the launching sector.

- Getting value-added from technologies through international partnerships

The Italian Space sector suffers due to its small size. As described, on the side of the “main program”, Italy concentrates on technologies that must be integrated inside international partnerships. This is the case of the radar systems used in the Rosetta mission, a cutting-edge Italian technology for observation used in an exploration mission. It also means that the Italian system sometimes doesn’t reach the critical mass needed to organise and exploit systems, but relies on individual personalities or small teams to carry on innovative work.

- a traditional partnership in Space with the USA

Italy has made a significant investment in the ISS, and has been a long-term partner of the USA in the Space Sector for scientific and political reason. It is through cooperation with the USA that Italy was able to create its space program, the San Marco project. These traditional old-time links, based on very useful and open cooperation with the USA, constitutes a legacy for Italy and its scientists.

Today, the main Italian university research labs work on a cooperative basis with their US counterparts. The US university exchange and research programs have always been

easy to access for Italian scientists, a relationship that has shaped the Italian space community.

Moreover, the Italian government has always had close ties with the USA, an overall policy that provided a favourable framework for cooperation in the Space sector specifically. Even if the sector is anchored within the ESA European programs, the USA has been always considered as the leader and catalyst for technological development. Silvio's Berlusconi's government has further emphasized this pro-American trend. This doesn't affect existing programs but means that there's a strong political backing for US space activities in Italy. The centre-right majority would encourage participation by the Italian space community in new US space exploration program also within the framework of overall partnership with the USA.

Italian participation in the ISS conforms to this framework. However current questions about the future of NASA programs also raises serious concern for space exploration in Italy.

Italian trends and perception towards space exploration

- Space Flight, a symbol of Italy in Space

Space flight is perceived as a symbol of cooperation with NASA : the shuttle flights of Italian astronaut's have been some key moments for the popularity of Space. Retired or in activity Italian astronauts are very often perceived as the living symbols of Italy in Space. Space community still refers to this symbol. Italian astronauts, members of the ESA's astronauts corps, are to be considered as "national flags", some of them being Air Force Officers. The shuttle problems in returning to flight affects this national policy, even if in a more symbolic than utilitarian way.

- Space Flight, an important research field for Italy

Some key-activities linked to space flight are under development in Italy, concerning critical security aspects such as :

- monitoring sensors for vehicles (Italian University labs)
- thermal protection / atmospheric return (CIRA research center)
- inflatable structure / morphing structure (Italian Universities + Industry)

The role of the CIRA (Centro Italiano Ricerche Aerospaziali, Capua) should be stressed. A framework agreement has been signed between CIRA and ASI, and CIRA has emerged as the first research structure directly linked to ASI, creating a new mechanism in the Italian panorama (ASI was until now a management agency with no internal research facilities). Even if this agreement doesn't affect the traditional project-oriented relationships between ASI and the space research community, the embryo of an integrated Italian research capacity shows the desire for more coordinated activity, particularly in human flights programs.

This Italian "human flight security" sector also reveals the need to be integrated with major international initiatives and could be an interesting "plug-in" access for future European and/or American human flight programs.

- A close relationship with NASA

As described before, Italian space exploration activities have always been closely linked to NASA. The risks for the ISS program and the important reform that NASA shall face is perceived in Italy with a friendly sadness. Obviously Italy is mindful of its own loss if the ISS program is diminished or partially cancelled. But the Italian space community identifies itself with the NASA problems in facing the US government rather than criticising an “American system” that might not give to the Italian partner the return on investment previously defined.

- ISS, a model not to be repeated ?

Participation in the ISS is both criticised and accepted. It is well accepted because of the overall, positive links with the USA and the absence of other opportunities for space exploration. Criticism focuses on the model of cooperation proposed. The ISS is criticized for being a political operation aiming at anchoring the Russian space sector with the USA. Now that the future of the ISS seems seriously compromised, returns for Italy are judged to be very low. The Italian Space community is in favour of new opportunities for cooperation with the USA in the exploration field, but with conditions that would ensure better returns than in the ISS case.

- Cooperation with the USA : industrial aspects

The Italian space industry is essentially controlled by the Finmeccanica holding. Even if Alenia Spazio and Telespazio have recently entered joint-ventures with French Alcatel Space, the Finmeccanica Group has a rather balanced policy between Europe and USA. Its satellite activities are clearly Europe oriented today and services will be developed on the national and European markets. But American space programs have always been perceived as an opportunity for a significant part of Finmeccanica space activities, like the Italian segment for the ISS. The new space exploration program announced by President Bush is also welcomed by Finmeccanica as an opportunity that Italy should not miss. The USA, ready to make a “next step into space”, has called for partners and Finmeccanica, interacting with NASA and US industry, is ready to propose collaboration. This positive appreciation for the USA’s future goals” contrast with the lack of unity, small budgets and minimal capacity of Europe. Due to the central position of the Finmeccanica management in the aerospace community in Italy, this positive appreciation of the US program is to be considered as a strong trend.

An Italian contribution to the SEPAG process of building up an exploration vision for Europe

- A strong commitment from ASI for exploration, the priority given to applications

ASI has developed a task force for space exploration in order to program both partnerships and independent activities. ASI is pushing for the definition of a “long term vision” for exploration, mixing identity and technological capacities. ASI wants present

its own vision to the ESA council next year. ASI considers in a pragmatic way the US exploration program : if there is a political trend that takes in consideration this program, ASI will go for it

ASI also aims to open the space sector to new users, to intensify application-oriented research. This indicates why, in a shrinking budget period, ASI is seeking new resources for Space : Italian space funding mainly comes from the Ministry of Research (89%), with some from the Ministry of Defence (Cosmo-Skymed) and the Ministry of Transportation (Galileo) funding.

The application-driven nature of ASI's new developments shows how, in Italy, space activities have to produce returns, shown also in the national satellite example. In that context, space exploration is perceived positively but must show prospects for returns .

Also, some officials call for national agencies that could evolve into "space service providers for the national administration". This change would to turn the page from the " age of pioneers " to a service-to-user management style on a national basis. Exploration would only occur on a European basis, also in correspondence to the multinational nature of the space industry in Europe. Within this scenario, there's a need for a stronger strategic role by the ESA and the EU and a greater efficiency in programs management.

- A "user driven" industrial logic

The main Italian space industrialists insist on the need to define a new phase for space activities, where application and services can boost the opening of a new market. These technologies are based on decades of experience in space. The objective is to develop some cutting edge Italian space engineering capacities (land-based services, stations, earth observation).

- A call for Defence investments in space

Key institutions and industries call for a stronger investment by the Ministry of Defence in space activities. Defence spending form the basis of US space activities, including exploration. The military space activities are still perceived as taboo; however there is a general consensus that this perception is not useful. The link between space activities and security policy should be enhanced within the context of CFSP/ESDP.

The Defence institutions does not have direct interest in exploration, except for space flights of its pilots, but is willing to invest more on low orbit capacities to define Space as an operational dimension, meaning improved capacities in positioning, observation and data transmission. Following this argument space should be included among the European capacities for defence and security, and Defence institutions should engage in the Galileo program in a substantive manner. The new Italian defence model aims to define a combat ready operation status with high technology support. Defence institutions need to invest in C4I and observation capacities, with a strong space technology component.

- Exploration : a luxury that Europe cannot afford?

Given industry demands resources most for space applications, space exploration is seen as positive but unable of defining a European identity project and unaffordable. This is perceived as a typically American, Russian or even Chinese mechanism, linked to broader political goals and demonstration of power. This is not integral to the development of Europe and will not be a catalyst for space activities.

A more pragmatic approach towards the sectors of excellence and the development of applications seems more suitable for Europe, also taking in consideration budget capacities.

Europe does not have the resources for an independent exploration policy with human flights. Europe shall target specific segments, also cooperating with US space program.

Scenarios for the future of exploration:

- Set Up a European “space service policy”, whereby control can be developed through a public/private partnership, meaning also European public control over the ownership of assets (example: space telecommunications companies) in order to ensure return for technological companies and investment.
- Coordinate European efforts more closely in the fields of education and research, as requested by the Italian space community, in order to provide continuity on a European level.
- Discuss and negotiate participation in future exploration with the US, seeking to coordinate national positions in order to avoid wasting resources. National policies in Europe, too linked to national budgets, result in many small agencies. Policy must be centralized coordinated, with a real “supra-national approach”.
- Define high-level European guidance in terms of relations with the US : not a simplistic “mission” or “identity through space” but a coordinated approach in terms of Exploration projects.

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