Development of commercial space transportation: Italian activity and perspective

Benedetto Marasa
ENAC Deputy Director General
• Italian Navigation Act establishes that ENAC is the Italian Civil Aviation Authority; it has the responsibility to issue regulation necessary to regulate the civil aviation

• ENAC was established on 25th July 1997 by Legislative Decree no.250/97 as the National Authority tasked to issue the technical regulation, carry out the surveillance and control in the civil aviation sector.

• ENAC is engaged in dealing with the diverse regulatory aspects of air transport system and performs monitoring functions related to the enforcement of the adopted rules regulating administrative and economical issues
Total staff: 834
of which:
44 Directors
190 Professionals
25 Flight Inspectors
184 Airport Inspectors
391 Administrative Staff

A Man Power Plan (MPP) is managed and updated, at single process level, in order to track the human resources needs.
ITALIAN AIR FORCE – GENERAL STAFF

3rd Department “Planning of Aerospace Resources”
- Formulating guidelines for the preparation and use of the aerospace tool,
- Contributing to the definition of the security and national defense policy
- Dealing with the issues related to military-technical cooperation of the Italian Air Force in the international arena.

1st Office: General Planning and Transformation;
2nd Office: Operational Capabilities;
3rd Office: Air Force Space Policy;
4th Office: Air Force International Policy;
5th Office: Intelligence & Awareness Policy;
Situation Room;
Project Managers;
ITALIAN AIR FORCE LOGISTIC COMMAND

1st DIVISION – “Flight Test Centre”

Flight Test Wing (Aerospace System Engineering Group)

Armament Department

Chemistry Department

Space and Aviation Medicine Department
Cooperation ITAF-ENAC

– Letter of Intent (LoI) for Sub-orbital Space Transportation - 17 March 2014
– Develop procedures and standards to support flight test activities of commercial sub-orbital flights within Italian National Air Space.
Cooperation on new emerging technologies:

- Remotely Piloted Aircraft
- Hypersonic and Sub-orbital flight
Memorandum of Cooperation FAA-ENAC
Washington, DC – March 12, 2014

- Cooperation in the development of:
  - Safety regulations
  - Standards
  - Licensing measures
  - Projects of mutual interest

- To be applied to commercial space transportation
First Meeting of the Cooperation WG
Washington, DC - 20 May 2014

Italian mutual interest project proposal for the introduction of Sub-orbital flights within Italian National Air Space
Topics

• Suborbital Flight Regulatory Framework
• FAA-ENAC/ITAF Space Projects of mutual interest
• Conclusions
Flight Domains

SPACE

NEAR AEROSPACE

AIR

S3

X43-A

XCOR/SpaceShipOne

Sh 325 kft/100 km

Ssh ttl

NEAR

XCOR/SpaceShipOne

AIR

Sh 65 kft/18 km
Goals

• To **pursue** possibility of routine sub-orbital flight operation
• To **develop** regulatory framework at National level and in the European context
• To **support** national industries already present or willing to enter in this field
Project

• To prepare rules and procedures and to **develop** facilities to allow experimental activities *within Italian National airspace*

• To **support** U.S. sub-orbital vehicles within Italian National Air Space
Italy: the PERFECT place in Europe for commercial sub-orbital flights

- Location
- Climate
- Tourist attraction
- Gateway to Europe
Programs of Interest

LYNX Mk. II Flight Profile
Single Stage Suborbital Spacecraft
Horizontal Takeoff - Horizontal Landing
www.xcor.com

+3 minutes
Powered Ascent
Max Airspeed - Mach 2.9

+4.6 minutes
Coast Upwards
Engines Off - 58 km (190,000 feet)

Apogee - 100 km (328,000 feet)
Microgravity Environment

Max G-force at Pullout: 4 G
Glide and Circle

Horizontal Takeoff From Runway
Horizontal Landing
Total Flight Time - 30 minutes
Programs of Interest
Programs of Interest

FIRST PRIVATE MANNED SPACE FLIGHT
Virgin Galactic's VSS Enterprise has set a milestone by becoming the world's first privately owned manned space vehicle to reach an altitude of over 60,000 feet in a space flight on Sunday.

Key Features:
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Mission Details:
- 
- 
- 
- 
- 
- 
- 

Launch Date: 

Mission Duration: 

Mission Outcome: 

Next Steps: 

*Information sourced from [The Guardian](https://www.theguardian.com) and [Virgin Galactic](https://www.virgin.com) official announcements.*
Doctrine

- Develop certification & regulatory framework:
  - *Ad hoc regime then....*
  - ....*Aviation-like*

- ENAC Long-standing experience in aircraft/organisation certification
Methodology
In developing national suborbital flight capacity

To look to FAA experience in Regulation, Organization, Training,
To ensure coordination at Europe level
Personnel & Expertise

- ITAF knowledge to manage flight tests/trials with a focus on launch and re-entry:
- Astronauts from Italian Air Force
- Experimental Test Pilots & Engineers
- Flight surgeons
- ENAC Professionals for certification, licensing and oversight
Existing Facilities

- Existing airports easily tailored to sub-orbital requirements and presented in the fashion of Spaceports
- Test Ranges and Flight Test Center to manage experimental aerospace campaign
  - Modelling & Simulation
  - Operational Test & Evaluation (OT&E)
  - Aerospace medicine
- Center for Italian Aerospace Research (CIRA) for engineering support
  - Wind and Plasma tunnel
- Ground Systems for surveillance and tracking of airspace and near-space systems used during sub-orbital flights
Ongoing studies

- **Simulations** developed by ITAF Flight Test Center in order to re-define the traditional aeronautical layer with Near-Space flight properties
Ongoing studies

XCOR Lynx Head Up Display @ 100 km altitude

God’s view from XCOR Lynx @ 100 km altitude
Possible Scenarios

Operate US Space Transportation Systems from Italy

– **Step 1** - Realisation of the first Spaceport in Italy, permitting sub-orbital flights with U.S. space transportation systems:
  - Horizontal take off and landing
  - Same take off and landing site

– **Step 2** - Realisation of a sub-orbital flight with a Point-to-Point navigation within two Spaceports:
  - Horizontal take off and landing
  - Common ballistic descent and landing on a Spaceport
Possible Timeframe

- Starting 2015: FAA like licensing system
- Starting 2017: Ad-hoc Regulatory Intermediate regime
- Starting 2020: Aviation-like approach
Conclusions

Italy offers the perfect geographic position and climate for accommodating sub-orbital flights

Introduce United States sub-orbital vehicles within Italian National Air Space

Benefits for both countries

In accordance with the MoC FAA-ENAC

We are willing to find the way to do it.
• Attendance to COMSTAC ISPWG would greatly help development of the Italian suborbital flight regulatory framework;

• A dedicated workshop on the suborbital flight will be organized by ENAC-ITAF in mid 2015;

• Participation of FAA AST and ISPWG representatives will be highly appreciated.
Grazie mille !!