

2nd ICAO/UNOOSA Space Symposium

Commercial Space Transportation in Italy. A framework in development

G. Di Antonio, M. Sandrucci, B. Marasa

ENAC Policy on Commercial Space Transportation

presented at
1st ICAO/UNOOSA
Space Symposium

Montreal, March 2015



**A Regulatory Policy for the Prospective Commercial Space
Transportation Certification and Operations in Italy**

Draft 1 – March 2015

Initiatives

International cooperation

FAA / ENAC MoC for the Development of Commercial Space Transportation (March 2014)

National initiatives



Hypersonic Flight WG

- *Communication & Institutional level*
- Enabling technologies
- Where we are – Towards what we can go
- Establishing a national road map

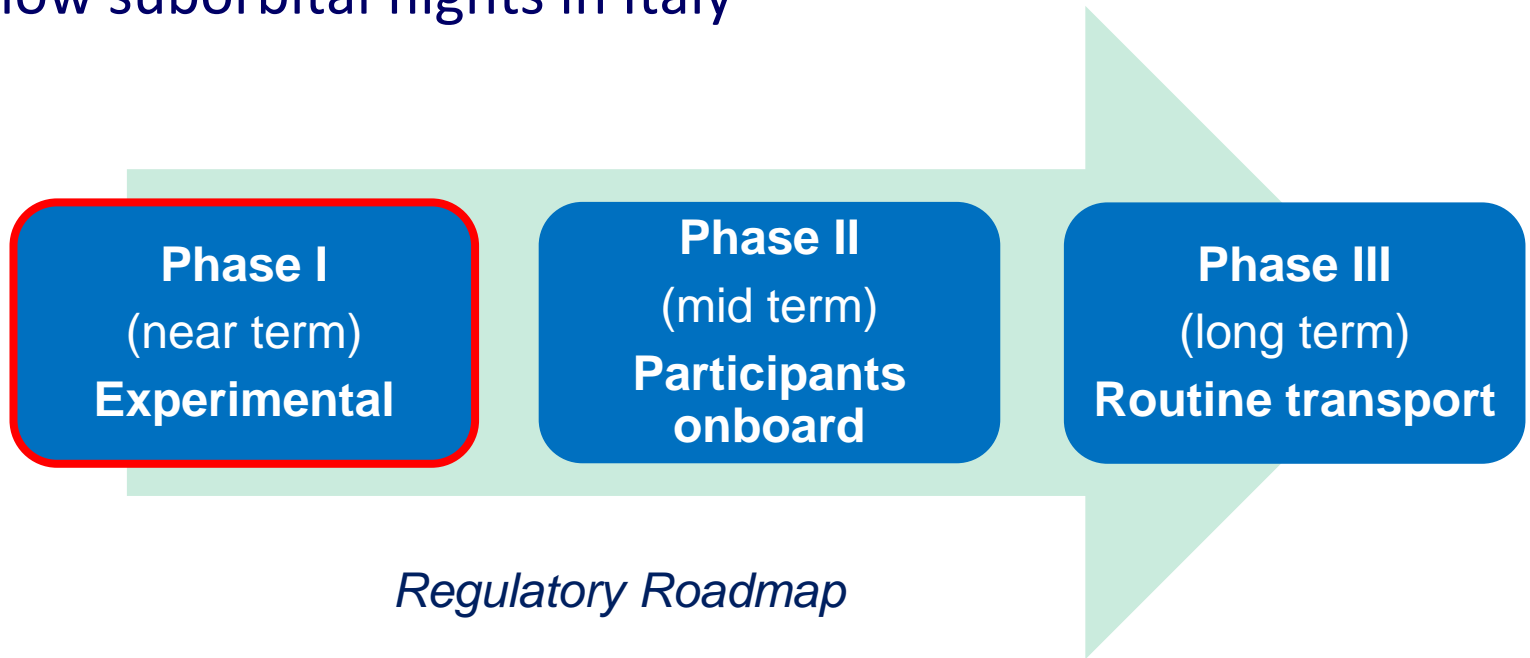


Suborbital Flight WG

- *Regulatory level*
- Legal and regulatory framework
- Guidelines for Phase I authorization

Objectives

To build up a **National legal & regulatory framework** to allow suborbital flights in Italy



Near term objectives to be achieved through **recognition of FAA-AST licensing system (for potential US operators)**

Initial spaceplane operations

FAA-AST license/permit validation

In the short term suborbital operations from Italy are likely to be carried out by a US operator with a FAA-AST license/permit, under a **wet lease** arrangement (for minimizing ITAR issues)

The operation centric approach

The safety requirements applicable to a spaceplane should be related to the **kind of intended operations**

Approval process

Should focus on the verification that the spaceplane is able to safely operate within a **specific set of conditions and limitations** to be established as a function of its design and specific operational activities

Phase I – Experimental Flight

How to allow a US operator to perform experimental suborbital flights in Italy?

ICAO definition
of aircraft



EU basic
aviation rules
(Reg. EC 216/2008)



National
Experimental
Permit to Flight

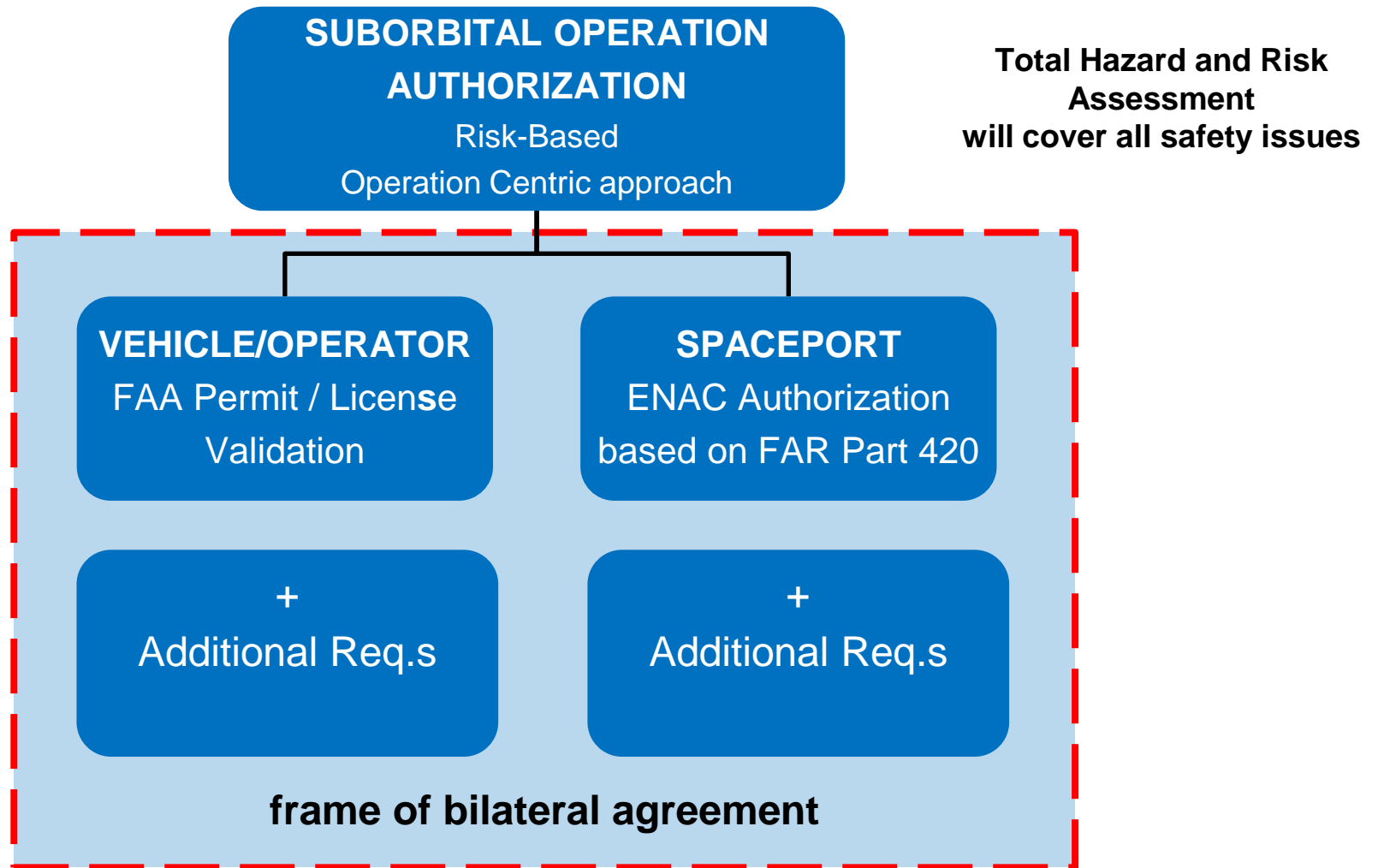
A **lift-supported spaceplane** could be considered an aircraft i.a.w. ICAO definition –

*“Any machine that **can derive support** in the atmosphere from the reaction of the air ”*

“Aircraft specifically designed or modified for **research, experimental or scientific purposes**, and likely to be produced in very limited numbers” are **under NAA responsibility** for airworthiness aspects (Annex II)

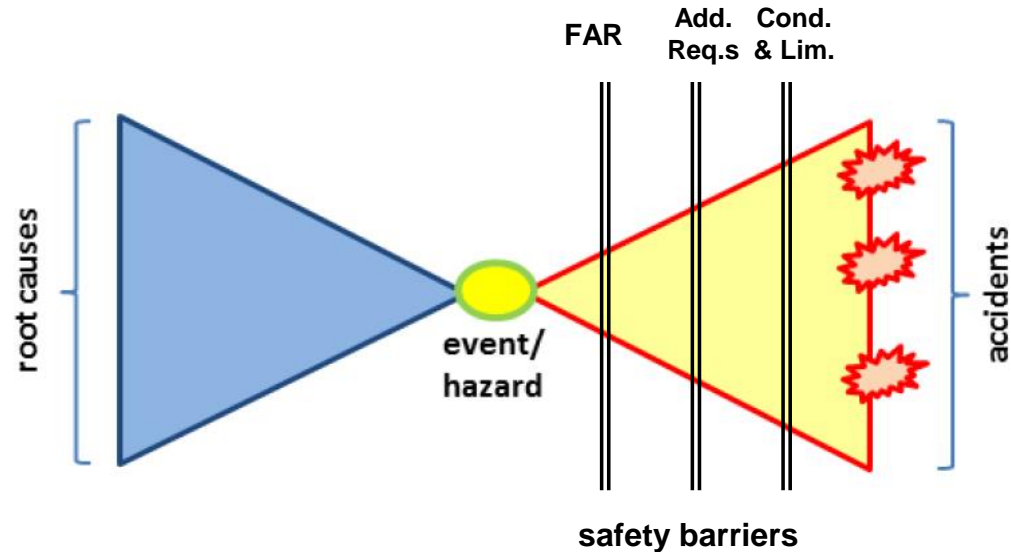
Italian Air Navigation Code allows ENAC to regulate National aircraft

Phase I – Experimental Flight



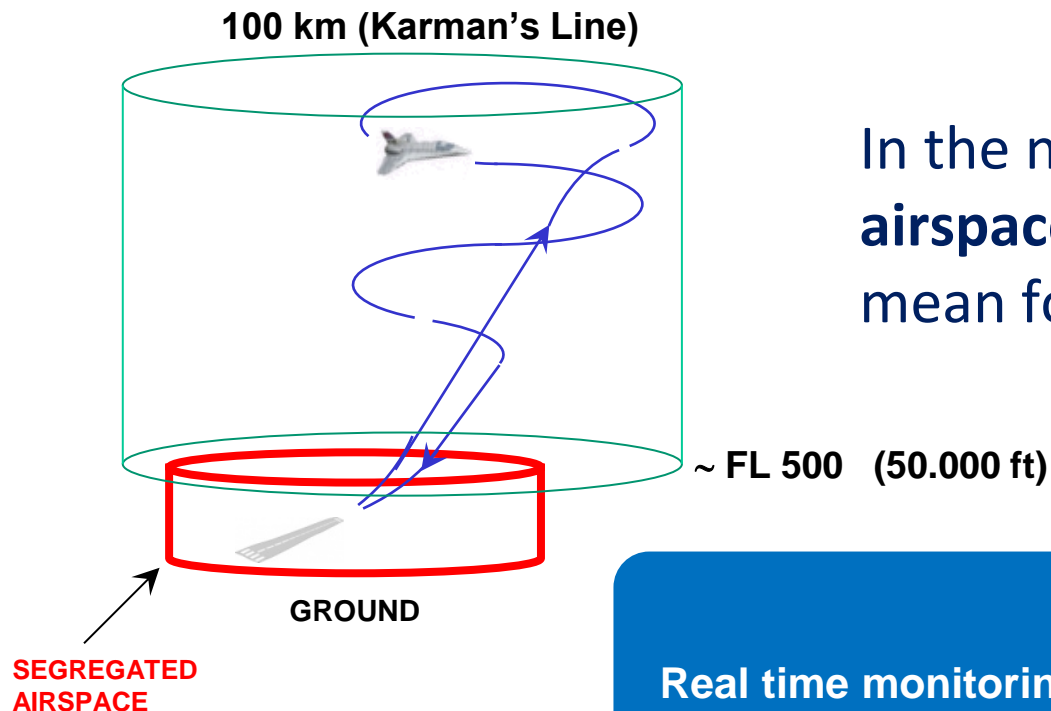
Total Hazard & Risk Assessment

- **All safety issues** are covered
- Formal, rational, systematic approach
- To identify and control all hazards related to design, production, operations, maintenance ...



- Similar approach followed by **JARUS** for **RPAS** regulation
- The **acceptable level of risk** (e.g. the US $3E-5$ casualties per mission) must be **clearly defined and agreed** – e.g on the basis of equivalence with risks posed by commercial aviation

Airspace scenario



In the near term **segregated airspace** is the most adequate mean for safe operations

Real time monitoring of the all trajectory is needed

ATM contingency plans in case of excursion or explosion (debris fall out)

ItAF support for analysis and simulation

US FAR Analysis & Issues

FAR Part 400–460 preliminary analysis carried out in order to identify **ISSUES** (i.e. Req.s to be adapted/investigated further) and set **ACTION ITEMS** for –

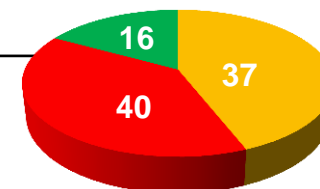
- Evaluation of FAA Regulation for **adoption** in Italy with possible adaptations
- **Validation** of a **FAA Permit** issued to a US Operator for experimental operations in Italy

Issues were classified against priority/criticality for **Phase I** (exp. ops.)

RED	deserving priority on management and resolution
AMBER	requiring adequate management after red issues work out
GREEN	not applicable at this stage

US FAR Analysis & Issues

FAR PART		RED	AMBER	GREEN	TOT
401	ORGANIZATION AND DEFINITIONS	0	4	0	4
404	REGULATIONS AND LICENSING REQUIREMENTS	3	1	0	4
405	INVESTIGATIONS AND ENFORCEMENT				
406	INVESTIGATIONS, ENFORCEMENT and ADMIN. REVIEW				
413	LICENSE APPLICATION PROCEDURES	3	3	7	13
420	LICENSE TO OPERATE A LAUNCH SITE	19	8	3	30
437	EXPERIMENTAL PERMITS	13	19	2	34
460	HUMAN SPACE FLIGHT REQUIREMENTS	2	2	4	8
TOTAL ISSUES		40	37	16	93
<p>PART 440 – FINANCIAL RESPONSIBILITY is dememd applicable but not analysed yet</p>					



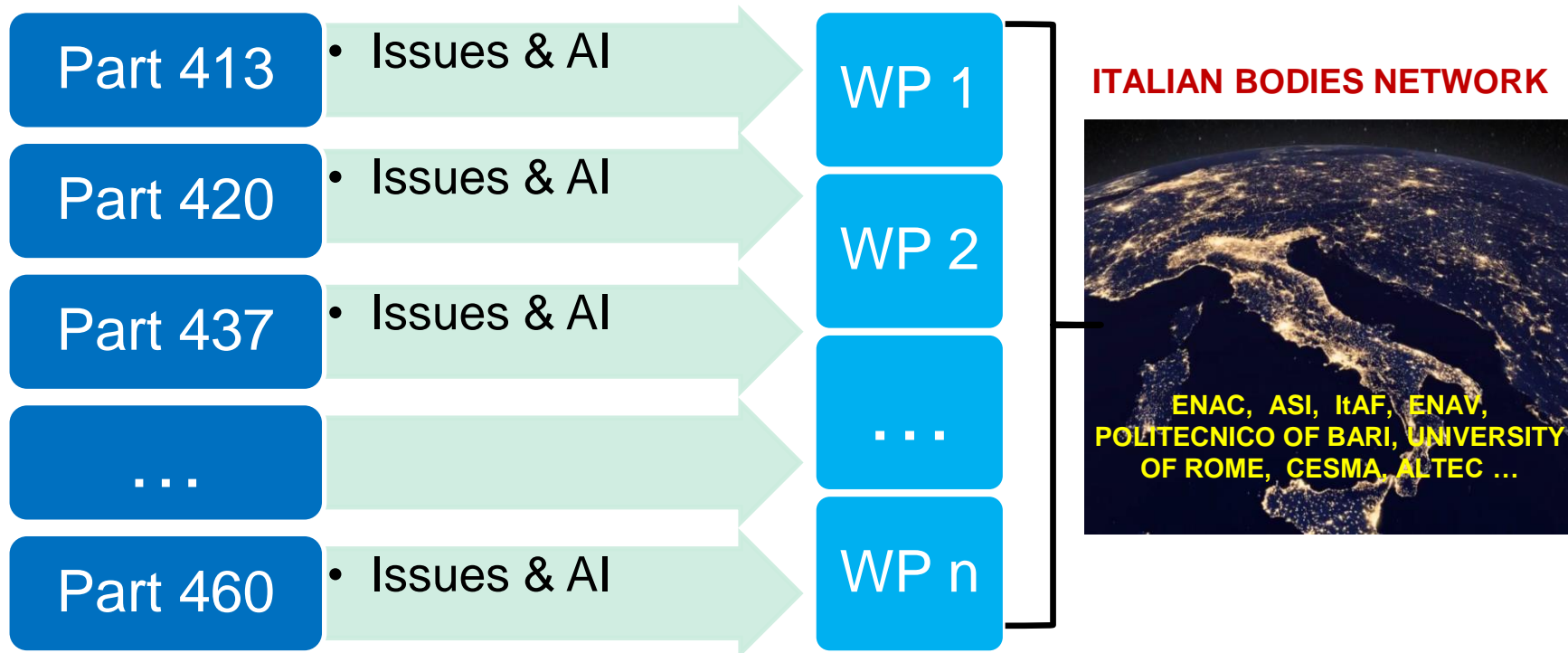
US FAR Analysis & Issues

Some significant **RED** issues –

- **Recognition/validation** of a License/Permit for a US operator would require a **Bilateral Agreement** and the **definition of jurisdiction** over operations
- Kind of **launch site authorization** in case of Experimental Permit
- **Spaceplane configuration management** and relevant impact on the Risk Assessment – **authority to inspect**
- **Mishap reporting and investigation roles** of US and Italian Authorities
- **Financial responsibility** (PART 440) to be analyzed for applicability and adaptation

Action Items Management

ISSUE = Piece of Req. to be adapted/ investigated further
ACTION ITEM = Action to be carried out in order to solve an Issue
WP = Working Package for Action Item(s) implementation



Future events



2nd International Symposium

**Hypersonic Flight:
from 100.000 to 400.000 ft**

Rome – Italy, 30 June -1 July 2016

www.cesmamil.org

