Italian National Airspace Strategy

ACHIEVEMENTS AND UPCOMING CHALLENGES

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achievements and upcoming challenges

The Italian National Airspace Strategy (NAS) is a collaborative initiative that unites all national aviation stakeholders, including airports, aircraft operators, the Air Navigation Service Provider (ANSP), the Military, the Regulator and the Government, behind a common goal, to deliver:

“A safe, secure and efficient Italian airspace
that has the capacity to meet demand,
balances the needs of all users
and mitigates the impact of aviation on the environment.”

The Italian NAS is a key part of the wider Single European Sky (SES) programme that provides the overarching framework for airspace modernization across Europe.
Our commitment to the NAS initiative has placed Italy at the forefront of the region in terms of airspace evolution initiatives, made in full alignment - when relevant - with the EU Regulations, the SESAR framework and the ATM Master Plan, while taking into account stakeholders’ requirements and local constraints to implementation.

Several important projects have been successfully implemented since the NAS initiative began in 2018, with many others being in the development phase, driven by the collaborative efforts of ENAV (Italy’s ANSP), the airline community, key Italian airports, the

Italian Air Force (ITAF) and the Civil Aviation Authority (ENAC).
After the first three years, the Italian aviation stakeholders are keen to maintain, enlarge and strengthen their collaboration through the delivery of the NAS Implementation Programme, which is outlined in the ‘Italian NAS Implementation Plan’. The Programme aims to ensure that the many different strands of airspace evolution activities, ongoing or planned in Italy, are carried out in a coordinated manner. It is a living document, regularly updated with inputs from NAS Implementation Stakeholders to reflect the delivery progress and new technological developments in the aviation sector.

Achievements

Since its launch on December 11, 2018, the Italian NAS initiative contributed to the successful delivery of several major airspace evolution projects, including the implementation of new airspace structures, operational concepts, technologies and procedures.

These achievements are summarised below:

Further improvement of the upper airspace

achieved by replacing the fixed route structure in the upper airspace with the Free Route Airspace (FRA) concept, allowing aircraft to fly a fully optimized path rather than using a standard network.

Free Route Airspace in Italy (FRAIT) is fully implemented across the upper airspace (above Flight Level 305), generating significant improvements in airspace capacity, direct routes and optimized flight profiles. Between 2016 and 2021 these improvements enabled operators to save approximately 26 million track miles and more than 600 million kgs of CO2 that would otherwise be released into the atmosphere. The project is helping to mitigate the environmental impacts of aviation in line with the sector’s overarching sustainability initiative “Destination 2050 – A route to net zero”. Italy was indeed one of the first pioneers implementing Free Route in Europe.

Another implementation project linked to FRAIT is the Flexible Use of Airspace (FUA) – to improve the booking and release of segregated

areas that are shared between civil and military users. ENAV and the Italian Air Force (ITAF) are working together to improve airspace management, using collaborative systems and tools to share up to date information about the progress of flights.

Evolution of terminal airspace

The Italian NAS initiative is helping to coordinate the redesign of the busy terminal airspace using more precise and flexible routes, based on Performance-based Navigation (PBN) specifications. Many Italian airports have already PBN routes. The detailed implementation is reported in the 'ENAV PBN Transition Plan' in line with the targets prescribed by the European PBN Implementing Rule (EU Regulation 1048/2018).

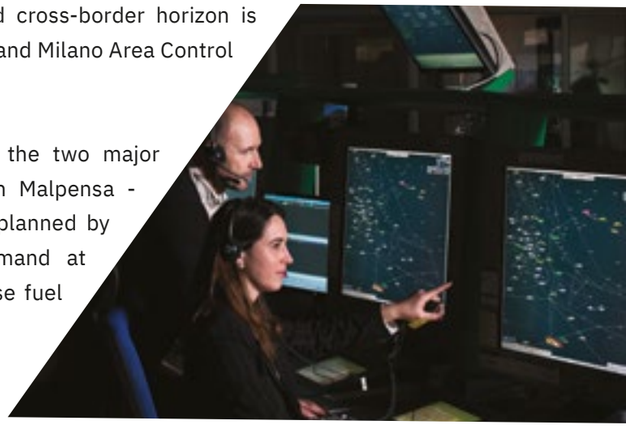
The more widespread the adoption of PBN routes, the greater the benefits. In the terminal airspace, the widespread adoption of PBN routes enables a more efficient redesign of airport arrival and departure routes so that flights can climb and descend more continuously, reduce fuel burn, emissions and better manage the impacts of aircraft noise.

GBAS Cat. III implementation is also considered key for further improving congested airports.

Closely linked to this, the current Communications, Navigation and Surveillance strategy included in the Italian NAS focuses on the technological transition from traditional radars, radios and ground navigation aids to satellite-based and datalink technologies. This transition is based predominantly on GNSS as main navigation infrastructure. In this way, Italy is delivering on the European and International ambition of implementing systems to support a more consistent, reliable and less workload intensive exchange of information (datalink technologies).

Improvement of runway throughput and airport connectivity, achieved by means of:

- the deployment of new air traffic management techniques that sequence traffic to improve arrival and departure punctuality. For example, an Arrival Management solution with extended cross-border horizon is planned for implementation at Roma and Milano Area Control Centres in 2022.



- the publication by ENAV - serving the two major airports, Rome Fiumicino and Milan Malpensa - of the suggested track miles to be planned by operators, according to traffic demand at different times of the day, to increase fuel efficiency.

- the deployment of Airport Collaborative Decision Making (ACDM) systems and associated procedures that gather the latest estimated landing times for inbound flights, improving the management of ground operations that is often the cause of air traffic delays. These systems are now in operation at key Italian airports, including Rome Fiumicino, Milan Linate, Milan Malpensa, Venice, Naples and Bergamo. In a related development, the first release of the Airport Operations Plan (AOP) is available and in use in the Aeroporti di Roma operational control rooms, through the implementation of a full Airport Operations Centre (APOC).

- the introduction of new systems and processes for sharing digital information about inbound and outbound traffic flows, enables air traffic controllers to construct an optimised sequence of departures tailored to maximising runway throughput and airspace capacity. The next step will be to connect AOP electronically with Network Operational Plan (NOP). Greater integration of the airports and the network level plans will allow a better management of ground delays and pinch points across the airspace.

- the ability to share up to date information about the airports' parking stands availability situation provides important situational awareness in the case of a rapid decision that a massive diversion should be taken, which is a major issue that NAS implementation stakeholders have been dealing with since the beginning of 2021.

Evolution of Air traffic management (ATM) systems and tools

ATM systems and tools are at the core of ATM operations and so, their evolution is a continuous effort. The evolution of ATM systems and tool has been the fundamental enabler of the benefits derived from many of the concepts presented in the above-mentioned initiatives. This ensures that air traffic controllers are informed by accurate data about the progress of flights in different airspace sectors.

The implementation of advanced tools for ATM, such as the provision of Pre-departure Clearances (PDC) and Departure Clearances (DCL) via Controller Pilot Datalink Communications (CPDLC), is part of the evolution of ATM systems and tools, as well as the implementation of Digital Automatic Terminal Information Services (D-ATIS), with the objective to improve performances and increase safety levels through higher automation and control.

Modernization integrates with other related infrastructure investments like airport expansions and Remote Air Traffic Control Towers.
Remote Towers improve flexibility in Italian airports and guarantee airport ATS 24h per day, seven days per week, as well as facilitate better planning of airport operations in response to the performance of the wider European airspace network.

Airspace modernization brings significant benefits, reducing flight delays and operating costs for the industry and increasing environmental performance, global connectivity, choice and value for consumers.

As a result, the Italian NAS aims to provide clear direction for industry stakeholders to build on the progress already made and ensure that Italy leads the way in exploiting opportunities to better manage the environmental impacts of aviation and in support of sustainability.

Upcoming challenges

The demand for aviation in Italy and across Europe – though heavily impacted by the Coronavirus pandemic – is steadily increasing. Last summer has been very encouraging and we are optimistic about traffic recovery in few years to 2019 levels, when Italy's enroute ANSP (ENAV) managed a total of 1.83m flights with peaks of 7,300 per day[1].

Now, more than ever, to keep up with the recovery, Italy's airspace requires ongoing modernization to continue serving the demand from commercial air transport, the Military and General Aviation and new fast-growing user groups such as unmanned aerial systems (UAS) or operations in the Higher Airspace.

Integration of UAS

Demand for unmanned operations in Italy is expected to increase significantly in the next decade. By 2035 unmanned operations are predicted to become one of the dominant forms of air traffic in terms of the number of flights. Demand from the established commercial air transport, general aviation, State and military operations is constantly growing and unmanned traffic is increasingly becoming a part of day-to-day operations.
The vast range of their possible uses has created a new industry with a large economic potential. Technological developments are arriving at a much faster pace than for manned aviation. Thus, new airspace designs, ATM concepts and CNS capabilities are required to integrate unmanned operations with manned aviation in a safe and efficient way that protects resilience and business continuity. ENAC, ENAV and D-Flight (a company established to this purpose), together with drone operators, are working in synergy to ensure the gradual integration of UTM with ATM in a safe and efficient way with no negative impacts on operations of traditional aviation.

Higher Airspace Operations

Similarly, the demand for activities in the upper layers of the atmosphere is becoming more and more concrete. There are many initiatives under development, such as suborbital flights, which are having considerable

1. August 3, 2019

media coverage, today, and include flights for commercial or scientific purposes, with innovative aircraft that depart and land from spaceports; other examples are those related to supersonic and hypersonic flights, transit flights/launches for putting into orbit of space objects (including launch operations from aerial platforms), re-entry flights from orbit.

All this resulted in the development of new traffic management operational concepts. Several initiatives are underway or being launched to promote operational solutions within the next 2-4 years aimed at the use of the upper airspace above 60.000ft.

Italy has also included the Space Economy among the objectives of national economic policy by virtue of the strong growth forecasts of the sector and the estimated effects for the entire national economy. To underline the key role of our country in this sector, it should be noted that the Taranto Grottaglie Airport has been identified as the first Italian Spaceport for Europe.
The Italian NAS stakeholders are closely monitoring any developments and opportunities deriving from technological evolutions in the aviation field.

The Italian NAS is based on the recognition that engagement and collaboration across all aviation stakeholders at both the national and European level is essential to implement the strategy successfully and maximize the benefits of continued airspace modernization for passengers, airspace users, airports, local communities and the wider economy.