Ente Nazionale per l'Aviazione Civile
Italian Civil Aviation Authority

ESA AO/1-9427/18/NL/MP – NAVISP-EL-3-018
Space for Urban Air Mobility space–based services

AURORA: itAlian Urban aiR mObility technologies & distrRibuted test-fAcility

ESA WEBINAR – 15 February 2024

AURORA
UAM National Test Facility

TELESPAZIO a LEONARDO and THALES company
CIRA Italian Aerospace Research Centre
DTA DISTRETTO TECNOLOGICO AEROSPAZIALE
d-flight
planetek italia
exprivia
CIVITANAVI SYSTEMS

AURORA Context

Urban Air Mobility (UAM) has been defined for the new aeronautical services provided by small aerial vehicles and drones in urban and extra-urban areas and encompassing both the people and goods air transportation and the monitoring and control aspects.
Positioning, Navigation and Timing (PNT) techniques are essential for safe and reliable navigation of drones; GNSS receivers combined with other techniques (satellite or ground augmentation, inertial and visual sensors) ensure safe and reliable navigation of drones in urban areas.

The AURORA project falls in this domain and has as its ultimate goal the development of an integrated facility for testing and validating the navigation capabilities of drones, and to support research and development of PNT solutions for UAM navigation.

AURORA is a project of the **ESA's Navigation Innovation and Support Program (NAVISP).**

AURORA is part of the **"Creation of an Italian ecosystem for AAM" framework**, that is coordinated and promoted by ENAC, to provide effective and reliable PNT GNSS based services for the AAM in urban and extra-urban environment. As such, the AURORA project can be considered as part of the Italian AAM national strategy.

Objectives and Goals

1. **Define the PNT Requirements** and Design a GNSS Based Architecture for Urban & Advanced Air Mobility (UAM/AAM).
2. **Implement** a GNSS based **PNT distributed testing infrastructure** addressed to AAM/IAS needs.
    - laboratories of DTA, CIRA and TPZ, with definition of the standard interoperability protocols and procedures that would allow future addition of other facilities and/or other experimental assets outside the current consortium. AURORA will be exploited not only by the members of the consortium, but even by third parties such as manufacturers, technology providers, application developers and service providers
3. **Investigate new PNT technologies for UAM applications**, performing laboratory and in-flight demonstrations of their effectiveness**.**

Project Team

Public body leading of an industrial group of skilled companies

ENAC
Project Coordinator

- *Italian Civil Aviation Authority*
- *Leader of Italian Board of UAM/AAM*

Telespazio
Technical Coordinator

- *SatNAV & SatCOM Service Provider & Operator*
- *ANSP Operator*
- *U-Space Expert and service provider by d-Flight*
- *GNSS Lab As A Service Facility*
- *UAM System Engineering Expertise*
- *UAV & GNSS Expertise*
- *Cyber Security Expertise*

CIRA
Aviation Expert & Labs

- *RPAS Test Facility*
- *UAM System Requirements Expertise*
- *UAV & GNSS Expertise*
- *Cyber Security Expertise*
- *Flight Laboratory for Aeronautical Research*

DTA
Grottaglie Airport Test Bed

- *Grottaglie RPAS Test Facility*
- *UAM System Requirements Expertise*

D-flight
Italian UTM Service Provider

- *U-Space Regulation Expertise*
- *UAV Traffic Management*
- *U-Space services Expertise*

Planetek
GNSS RFI Expert

- *Geomatic and Earth science Expertise*
- *Expertise in RFI of GNSS*
- *Development of software for space missions*

Exprivia
ICT Expert

- *Grottaglie UAV Experiment Monitoring System Development*

Civitanavi Systems
GNSS Sensors & IMU Expert

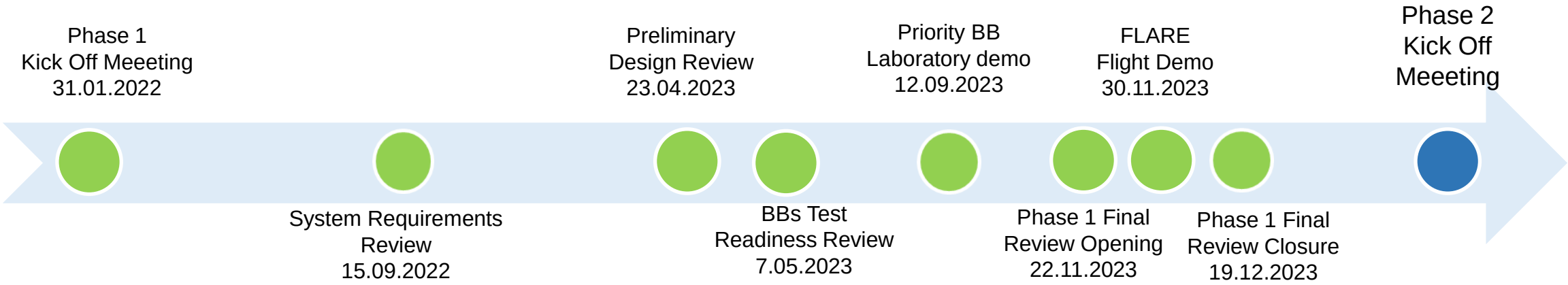
- *Design and manufacturer of Inertial Navigation Sensors & GNSS measurements systems*

Project Phases

According to ESA and ASI recommendations, AURORA is a **2 phases project initiative**:

Phase 1 (from 31/01/2022 to 19/12/2023) aimed to:

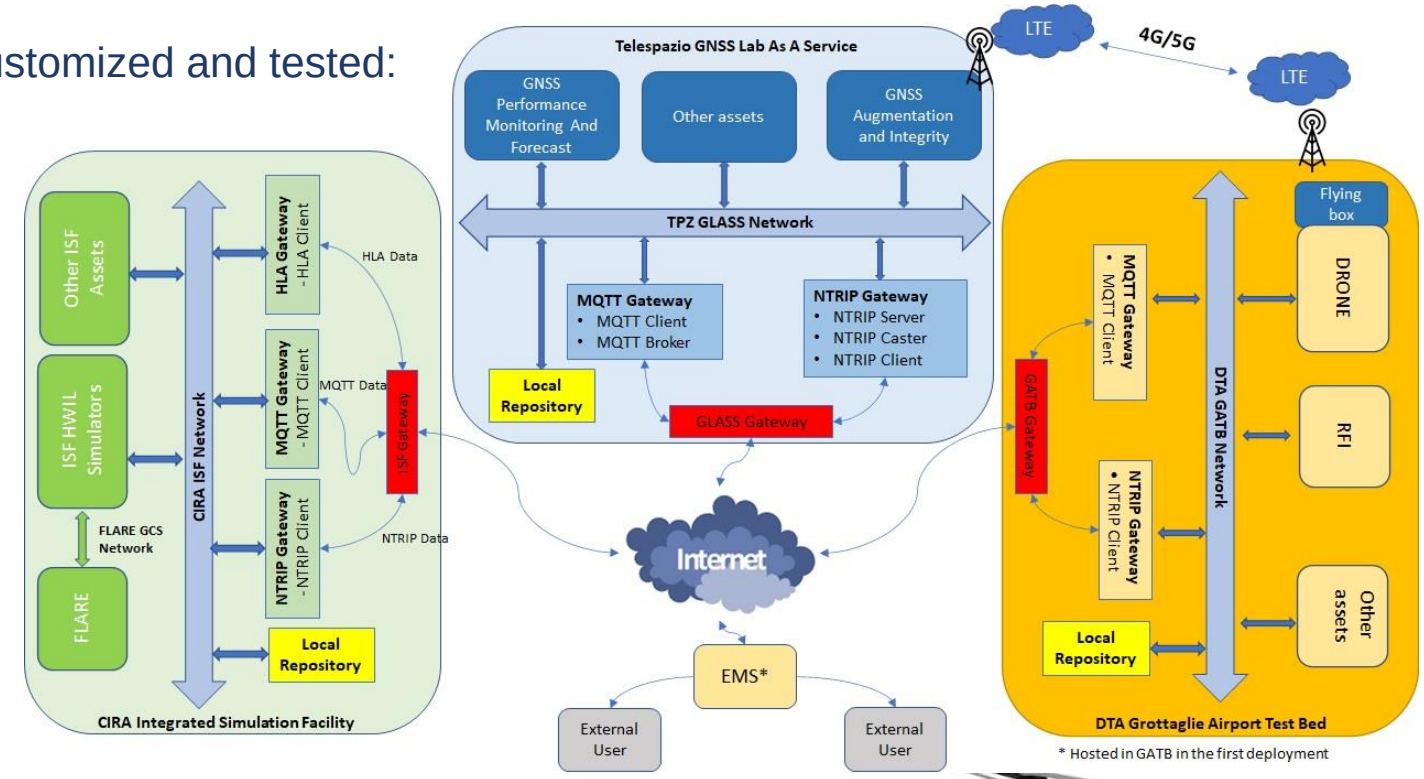
- define a GNSS infrastructure that can be implemented within the national UAM mission scenarios for the Unmanned Aerial Vehicles.
- Provide the Preliminary Design and Justification of the UAM National Distributed Test Facility.
- Validate, through laboratory and in-flight demonstration activities, a prototype of the Test Facility.



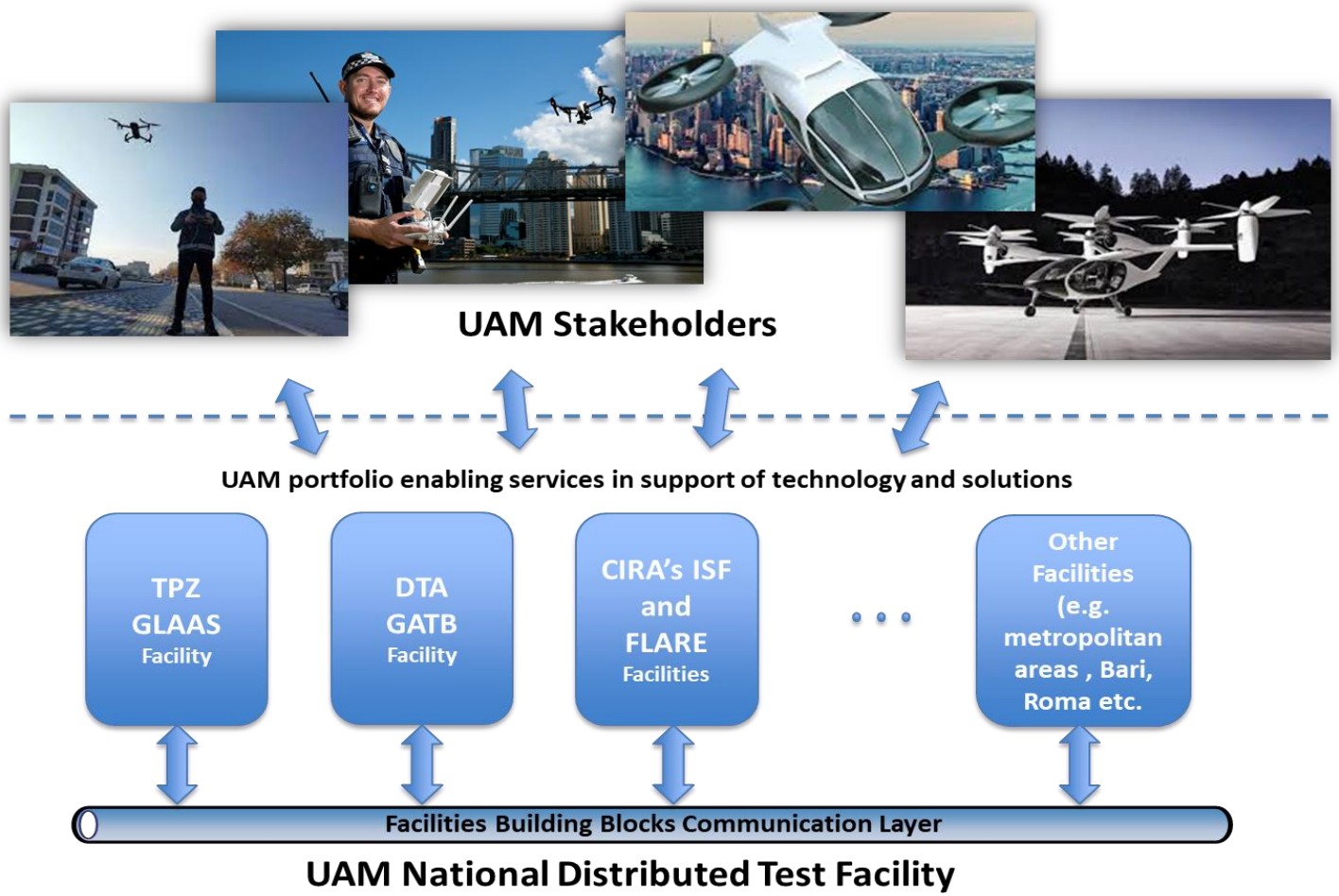
Phase 2 will be focused on realization of the UAM National Test infrastructure and demonstration of its capabilities.

Phase 1 main results

- ✓ System Requirements of the National Distributed PNT Test Facility for AAM/IAS and of the GNSS Based Infrastructure have been defined
- ✓ Preliminary Architecture of the national Distributed PNT Test Facility has been defined
- ✓ The following priority BBs/subsystems have been customized and tested:
  - GNSS Performance Monitoring and Forecast;
  - GNSS Augmentation and Integrity;
  - GNSS RF Spectrum Monitoring;
  - Hybrid Navigation Unit;
  - GNSS Threats Simulator for UAM
- ✓ First Prototype of the Distributed PNT Test Facility has been implemented integrating the Priority BBs
- ✓ Phase1 Lessons Learnt Collection and Analysis



AURORA PNT Distributed Test Facility

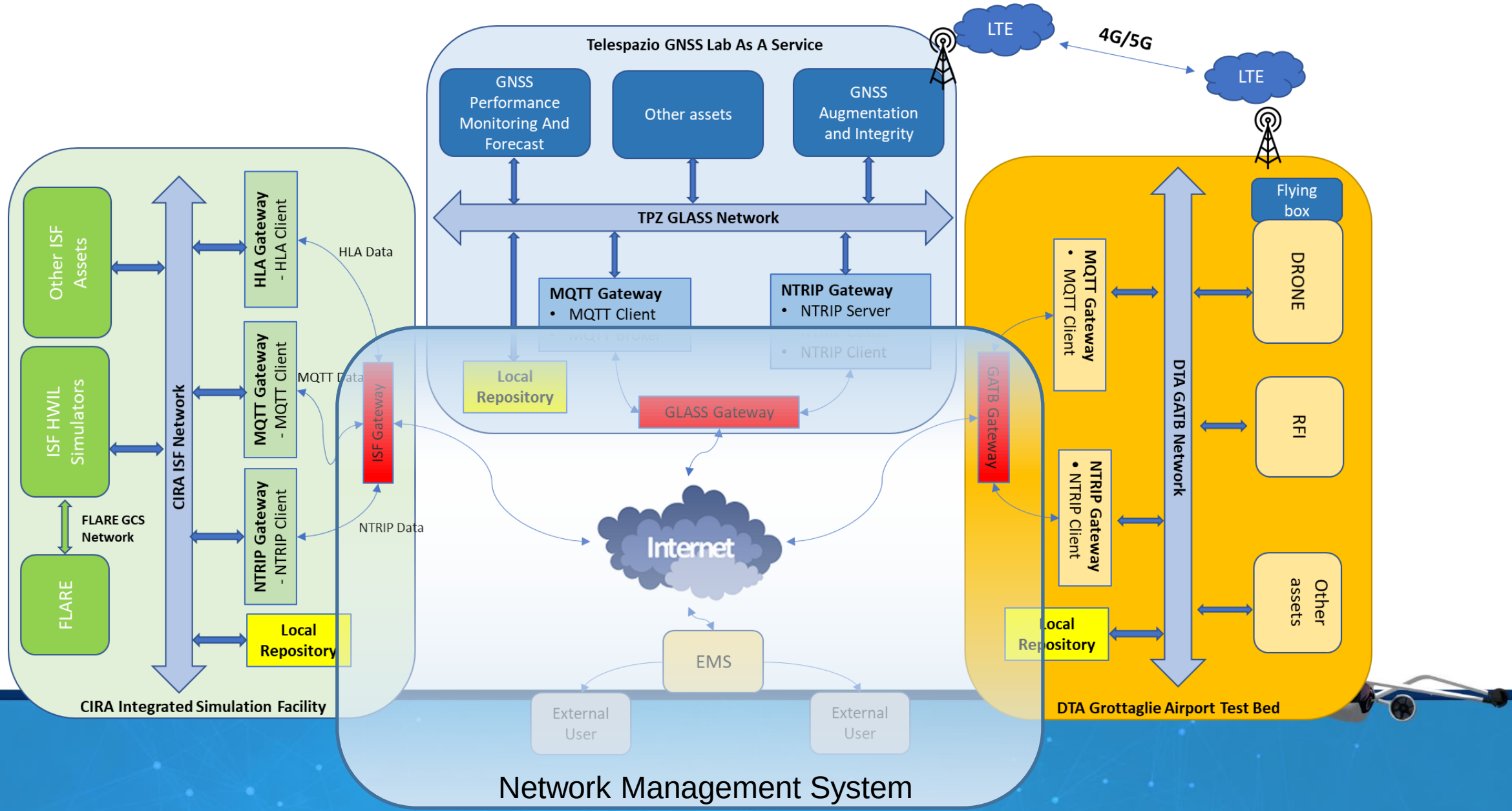


Distributed Approach:
The facility will be composed of laboratories and/or test infrastructure located in different places in Italy

- **GLAAS** - GNSS-PNT test labs at Rome from Telespazio.
- **GATB** - Airport of Grottaglie – Taranto Test Bed of DTA.
- **CIRA's labs** of Aeronautical technology at Capua (Caserta) and experimental vehicle **FLARE** (P92-Echo S of Tecnam)

Cascading Approach:
Customers will be provided with the possibility to be connected to the AURORA test facility and receive the test data during the test execution

AURORA Testing Facility Preliminary Architecture



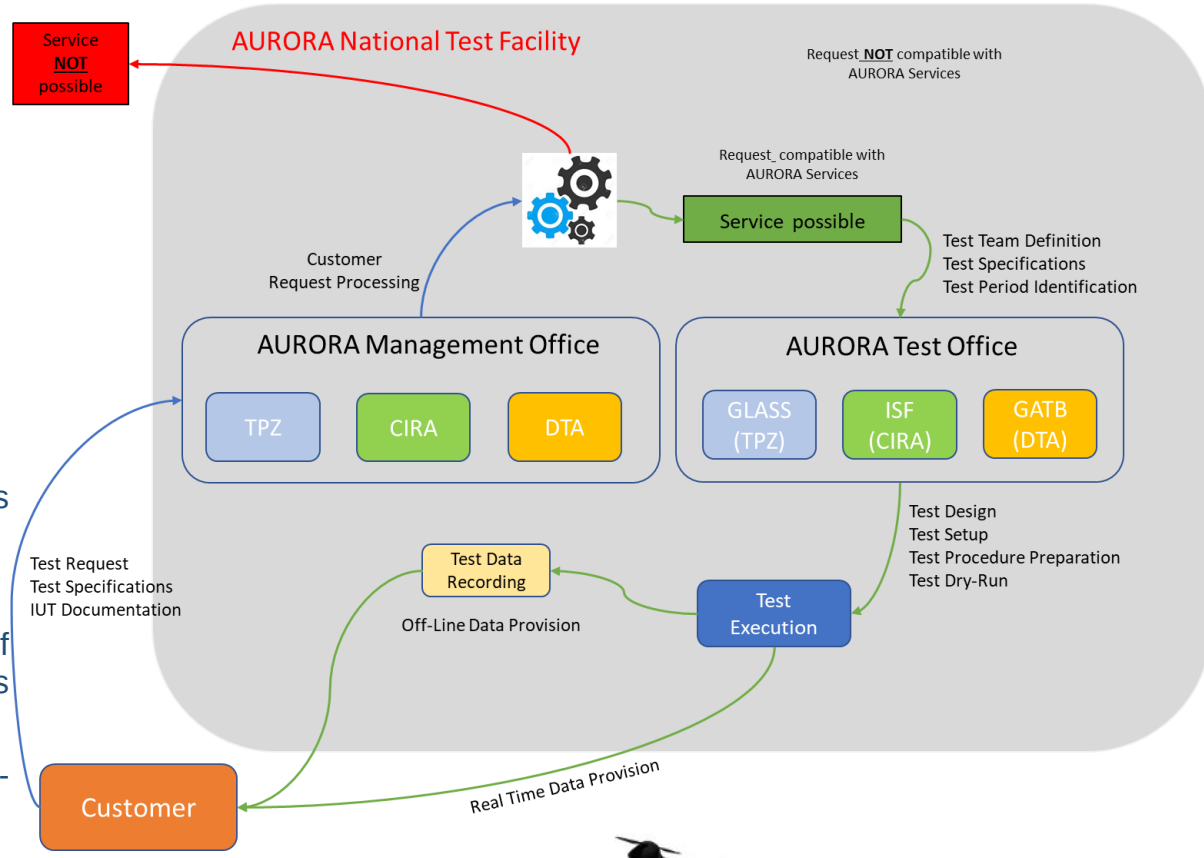
AURORA Test Facility Operation Concept

AURORA Management Office

- define and maintain the AURORA Test Facility Test catalogue
- act as focal point for all the external entities defined in the context diagram
- manage the interactions with the potential customers
- define and maintain the AURORA Test Facility Applicable and Reference Documents
- verify the technical feasibility of the requested tests
- engage and coordinate the AURORA laboratories activities and tasks
- define and maintain the overall AURORA Test Facility activities schedule
- define and maintain the AURORA Test Facility web site

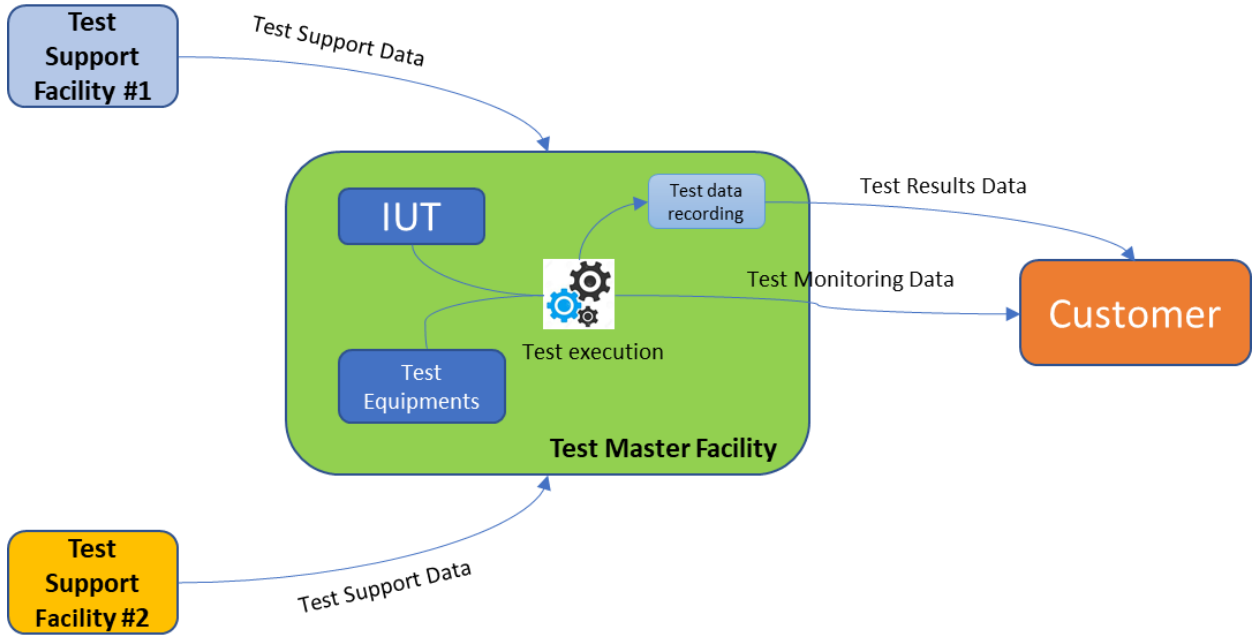
AURORA Test Office

- design of the test starting from the customer specification
- preparation of the test setup (includes the IUT integration in the laboratory facilities and/or on the flying platforms)
- preparation of the test procedures
- execution of the test dry-run with the participation of the customer, aimed at verifying if the test results are in line with the expectation or if there are some fine tuning activities to be done before the official test.
- execution of the test, with collection of test data and their provision (in real time or off-line) to the customer
- test decommissioning, test report preparation and provision to the customer



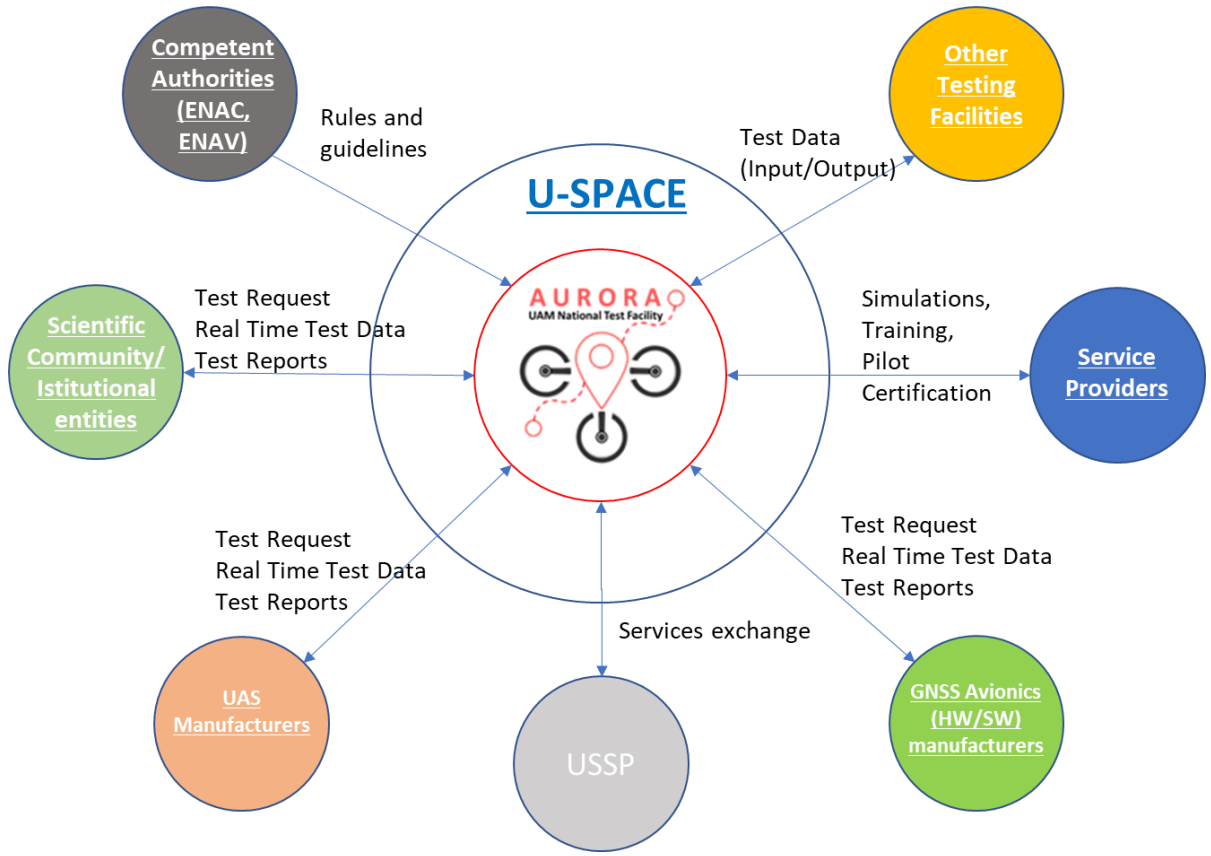
AURORA Test Facility Operation Modes

- **Stand Alone Mode**. In this mode a test requires one single laboratory or one flying platform to be executed, i.e. each laboratory can work independently from the others. Neither interconnection between the laboratories nor info/data exchange is foreseen during the test. This is an important feature since allows for parallel and contemporary tests execution.
- **Collaborative Mode**. In this mode a collaboration is required between the different laboratories at GLASS, CIRA and GATB, in order that one or more functions owned by one laboratory are made available to other laboratory or to the flying platforms to execute the test according the customer specifications. For example, the GNSS threat simulator of the CIRA ISF could be requested to configure and inject failures during a drone test at GATB. In collaborative mode, depending on the test to be executed an entity can assume the role of Test Master Facility or Test Support Facility
  - The **Test Master Facility** is the entity at which the test is physically performed and requires the support of other entities for those features it does not have.
  - The **Test Support Facility** is the entity that provides support and the functions required for the test and that the Test Master Facility does not own.



AURORA Test Facility Stakeholders

1. **ENAC/ENAV**, as the Italian aviation certification authorities, that will provide the rules and guidelines for the facility management and usage
2. The **Scientific Community** that will use it to test and verify novel solutions in the field of PNT technologies
3. the **UAS manufacturers** that will use it to test, verify and validate new drones and/or new drones concept especially for what concerns the PNT capabilities with respect nominal conditions and in presence of particular threats, both in simulated and in a real flight conditions
4. The **USSP**, that could be interested in the operational and flight-testing capabilities offered by the AURORA Testing Facility for the prototyping, verification and validation of U-SPACE services that could be implemented in the future.
5. The **GNSS and Avionics manufacturers** (both HW and SW), that will use it to test, verify and validate new commercial navigation systems and/or new navigation infrastructures
6. The **Service Providers**, that will use the facility to test and simulate scenarios of specific missions or operations, and for training and certification purposes
7. Other **laboratories and /or other testing facilities**, that could be interested in joining the AURORA testing platform or vice versa that the AURORA testing facility could wish to integrate to improve its testing capabilities and performances



User Needs Addressed

✓ Analysis of Use Cases and Scenarios aiming to cover the project objectives

1. **Research and Development of PNT technologies for UAM**
2. **Laboratory and In-Flight Validation of ground/onboard PNT components**
3. **Certification of ground/onboard PNT components**
4. **Research, Development and Assessment of systems and procedures for UAM Navigation**

ID	Main Actor	Summary
UC-TF-01	Test Facility Operator	HW in the loop PNT subsystem testing
UC-TF-02	Test Facility Operator	Onboard PNT subsystem testing – using Flare
UC-TF-03	Test Facility Operator	GNSS Cyber security testing
UC-TF-04	Test Facility Operator	PNT Performance Validation in a real environment - using a Drone
UC-TF-05	Test Facility Operator	GNSS Performance Monitoring facility testing
UC-TF-06	Test Facility Operator	GNSS Based Surveillance subsystem testing (I/F with ATM and USSP)

CIRA: Developments & Testing Facility Capabilities

Within Aurora, CIRA :

- upgraded the already existing CIRA Integrated Simulation Facility introducing the detailed simulation of Multiconstallation/Multifrequency GNSS receivers with multipath and visibility effects correlated to a high definition terrain and obstacle digital map for UAM scenarios.
- developed a GNSS Threat Simulator, capable to inject GNSS Threats like RF Interference, Spoofing as well as specific satellites/constellation failures directly on the measured observables
- Supported Civitanavi Systems in the development of a Hybrid GNSS/IMU Navigation System with ARAIM features
- Performed Real Time and Flight Testing of the above Building Blocks

Real Time Hardware in the loop Laboratory Testing Capabilities

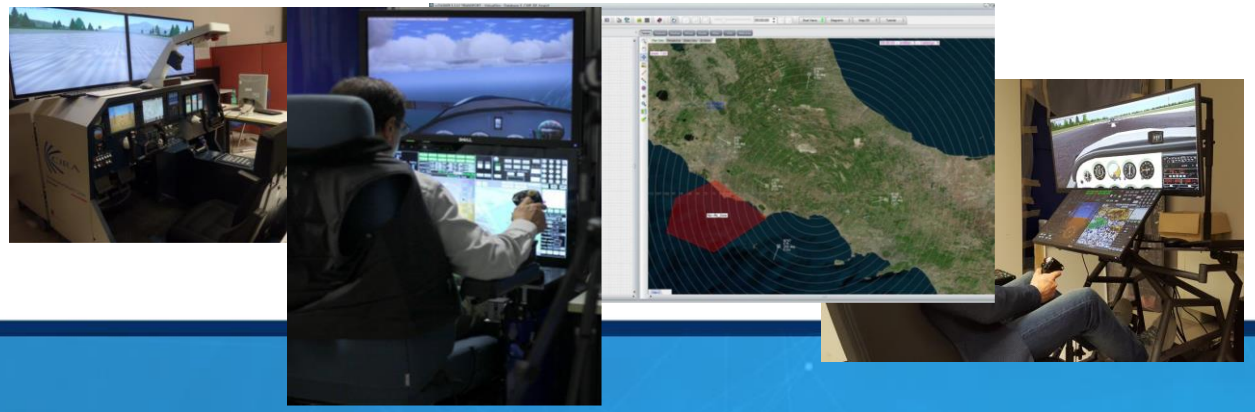
- Real Time Hardware in the loop Tests aim to verify performances and evaluate KPIs of the Item Under Test with respect to one or more verification scenarios specifically designed
- Physical environment simulator is able to provide a full set of measurement to the Item Under Test with dedicated and specialized physical interfaces (RS-232, RS-422, Ethernet, ARINC, etc)
- Simulation scenario include (but it is not limited to):
  - Reference Flight Platform (Very light Aircraft, Drones, etc…) and related Flight Plan definition
  - Specific GNSS constellation status including three different constellations (GPS, GALILEO and Beidou)
  - Detailed Terrain and Obstacles Map affecting GNSS Visibility as well as Signal strength and Multipath effects (for example Urban scenario)
  - Possibility to inject GNSS Threats like RF Interference, Spoofing as well as specific satellites/constellation failures
  - Possibility to inject specific failure on the other sensor measurement systems (IMU, Air Data, etc…)
  - Inclusion of Flight Vehicle Traffic and related Air Traffic Control also with Human in the loop (Pilots and Air Traffic Controller).

Flight Testing Capabilities

- Flight Test aim to verify and validate the Item under Test in a real flight environment around the Capua Airport area by using the CIRA FLARE OPA platform .
- All the features and scenario (simulated) elements related to the HW in the loop testing can be applied in real Flight

HWIL Laboratory and FLARE Optionally Piloted Aircraft

- CIRA HWIL Laboratory also called Integrated Simulation Facility (ISF) includes manned/unmanned vehicles and allows a realistic and complex ATM & multi-agent scenario simulations:
  - A Scenario Simulator which manages the common scenario
  - Two detailed simulators of unmanned vehicles (MALE and Tactical)
  - One General Aviation/Urban Air Mobility vehicle
  - One Air Traffic Controller Working Position
  - Two Pseudo-Pilot stations (for piloting air traffic)
- Common Simulated scenarios include traffic (including drones), weather conditions, GNSS constellations (i.e Multiconstellation /multifrequency satellites) and related threats (visibility and multipath due to Terrain/obstacles, cyber-attacks, RFI threats).



- FLARE test facility, is a flying experimental (RPAS) vehicle capable to perform an autonomous flight. It is based on a modified TECNAM P-92 ECHO with the related Ground Control Station and a dedicated LOS datalink, located close to the Capua Airport in CIRA premises
- Datalink has a nominal range of 10 Km, with both a high directive tracking antenna allowing about 12Mbps in downlink.
- A Payload (i.e the Item Under Test) can be installed onboard
- Onboard available sensors include IMU, Air Data, RTK Data (for performance comparison means) and two MCMF GNSS Receivers
- the onboard pilot is the Pilot in Command, responsible for the flight, and he must operate the vehicle according to the Permit To Fly limitations, inside the authorized Flight Test Area

GNSS Threat Simulator

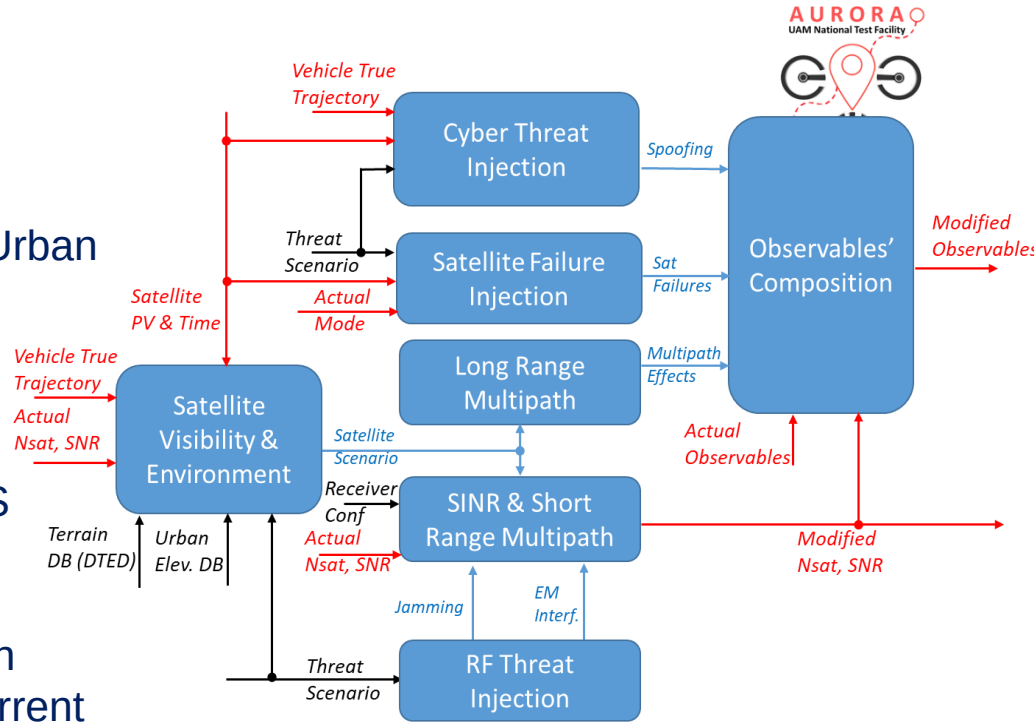
- HWIL Simulator for UAM capable to simulate :
  - Three Satellite constellations (i.e. GPS, GALILEO and Beidou)
  - Terrain orography and signal obstacles with related Multipath effects in Urban Scenarios
  - Satellite/Constellation failures (i.e step or ramp), Spoofing and Jamming Threats

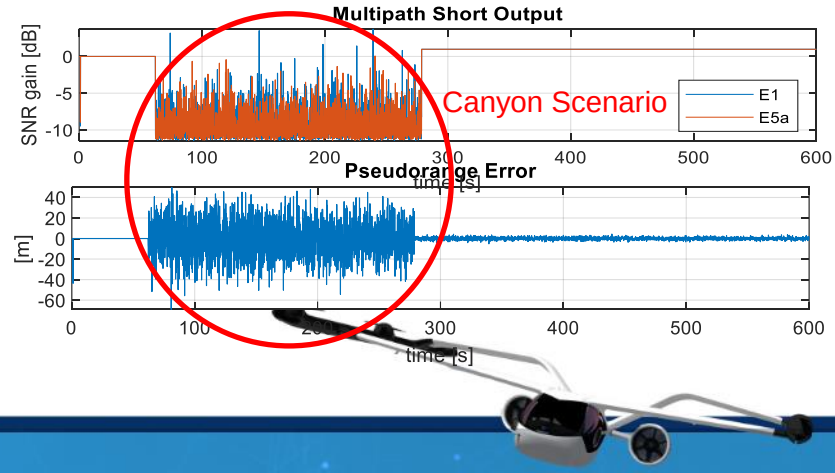
- Based on a CIRA previous heritage (Dual Frequency/Multiconstellation GNSS Simulator) and specifically customized and extended for a Real Time usage

- Operational concepts is based on the idea to use specific threat models which modify observables (i.e pseudoranges, C/N0, and so on) according to the current scenario

- This approach allows to use a such kind of Threat Simulator in both laboratory and real environment (i.e in-flight) by applying the Threat effects (i.e visibility, multipath, failures, spoofing or jamming) directly on a real GNSS receiver output in order to feed the Item Under Test and test its beaviour

- Demonstrated in flight with FLARE

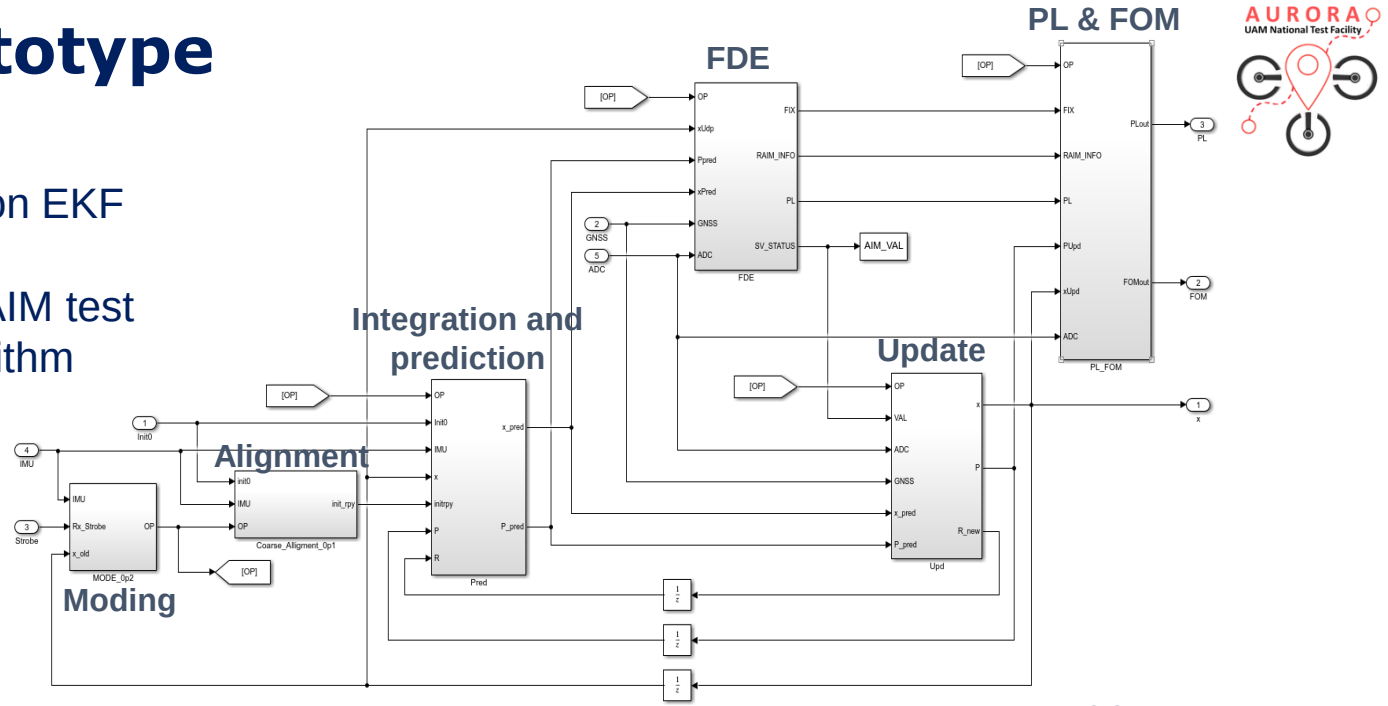




Hybrid Navigation Unit Prototype

- **Software**
  - Error state Tightly-Coupled Multi Constellation EKF
  - Multiple Fault detection & exclusion integrity monitoring based on the combination of an AIM test on EKF residuals and a snapshot FDE algorithm

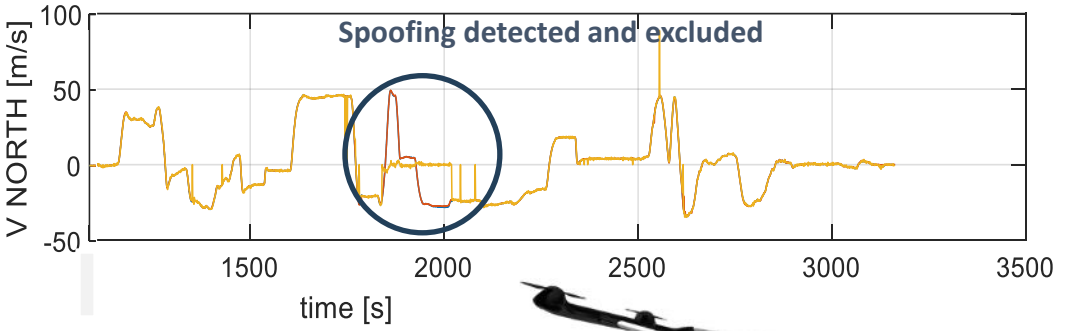
- **Hardware**
  - DFMC GNSS receiver
  - IMU (FOG based)
  - ADC
  - Processing Unit



The navigation unit prototype was developed by Civitanavi Systems and CIRA following the steps below:

a) The algorithm was developed and tested in a numerical simulation environment
b) The prototype was assembled and tested in HIL, using software auto-coding
c) Navigation Unit Prototype was mounted on CIRA FLARE for flight testing

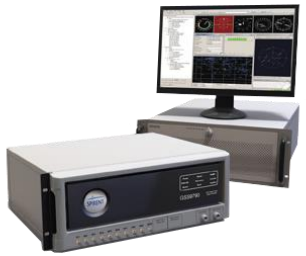
Example of flight test result w.r.t. GPS RTK reference



TPZ GLAAS capabilities

The TPZ GNSS Laboratory includes the following main HW & SW:

- ❑ RFCS Spirent GSS 9000 capable to simulate up to 12 Galileo (E1, E5, E6) and 12 GPS (L1, L5) satellites in view;
- ❑ AWG Agilent N5172B (frequency range from 100 KHz to 3 GHz);
- ❑ Record and Play-back system (RPS) Spirent 6425 (BW 50 MHz, 2 bit-depth I&Q);
- ❑ Real Time Spectrum Analyzer Tektronix 5100A;
- ❑ Septentrio receivers (PolaRx 4 TR PRO, PolaRx S PRO and PolaRx 3eG);
- ❑ Active GNSS Antennas (supported frequency bands E1/E5/E6);
- ❑ Spirent SimGEN SW for the generation and monitoring of the simulation environment;
- ❑ Spirent SimSENSOR SW for simulating the output of INS systems;
- ❑ GNSS Assistance Data Dispatcher SW;
- ❑ NovAtel GrafNav Post-Processing SW (RKT and PPP);
- ❑ In-house developed tools for GNSS navigation data specific analysis (i.e. KPI and metrics generation)



WAYPOINT PRODUCTS GROUP

spirent™ Federal Systems

The abovementioned resources are mainly exploited to provide **GNSS-related services**, such as:

- ➢ *GNSS constellation simulation, interference simulation, signal record/playback, spectrum analysis*
- ➢ *Trajectory post-processing (for performance assessment, georeferentiation and navigation unit validation)*
- ➢ *GNSS assistance (distribution of navigation data exploiting reference GNSS receivers)*
- ➢ *GNSS KPIs evaluation (real-time and post-processed).*
- ➢ *GNSS Performance Monitoring and Forecast (on airspace volumes or trajectories using URE predictive models)*

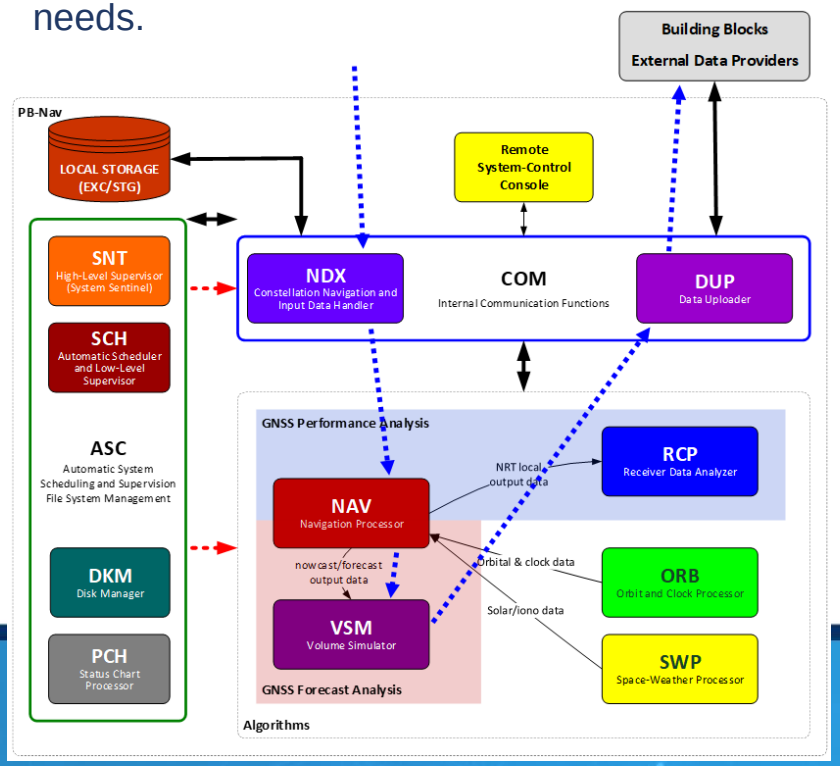
TPZ GLAAS capabilities

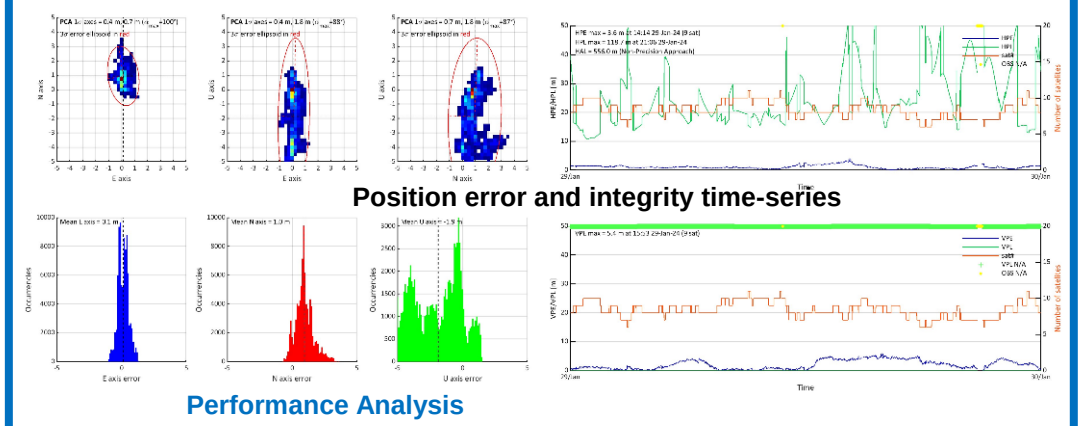
GNSS Performances Monitoring and Forecast

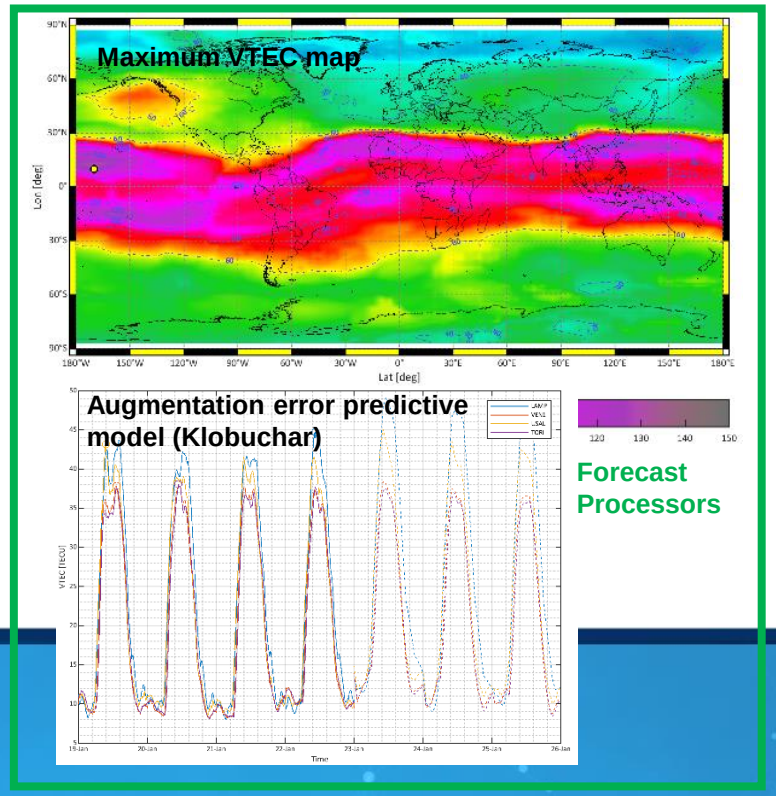
It provides users with detailed reports on the current and future performances of GNSS user-equipment to verify that the achievable GNSS performances in a specific volume or along the trajectory associated with a drone mission (or flight plan) during the pre-flight phase meet the expected performance level requirements.

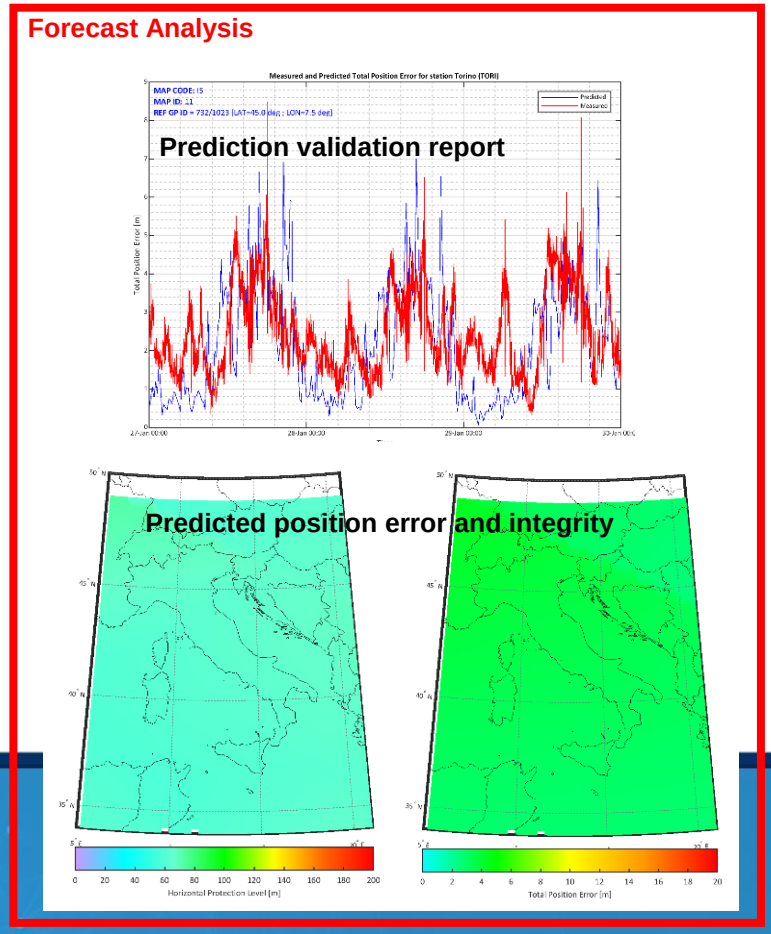
Two services are provided:

- **GNSS Performance Analysis:** evaluation of past and recent (NRT) performance KPIs measured by a network of GNSS reference stations.
- **GNSS Forecast Analysis:** estimation of future conditions of GNSS systems, in volumes, areas or trajectories specified by users on the basis of their operational needs.









TPZ GLAAS capabilities

GLAAS – focus on GAG module (hardware/software)

Flying box

GNSS Augmentation and Integrity Module

On-board processing, data storage (with test case replay capabilities), GNSS raw data acquisition and distribution

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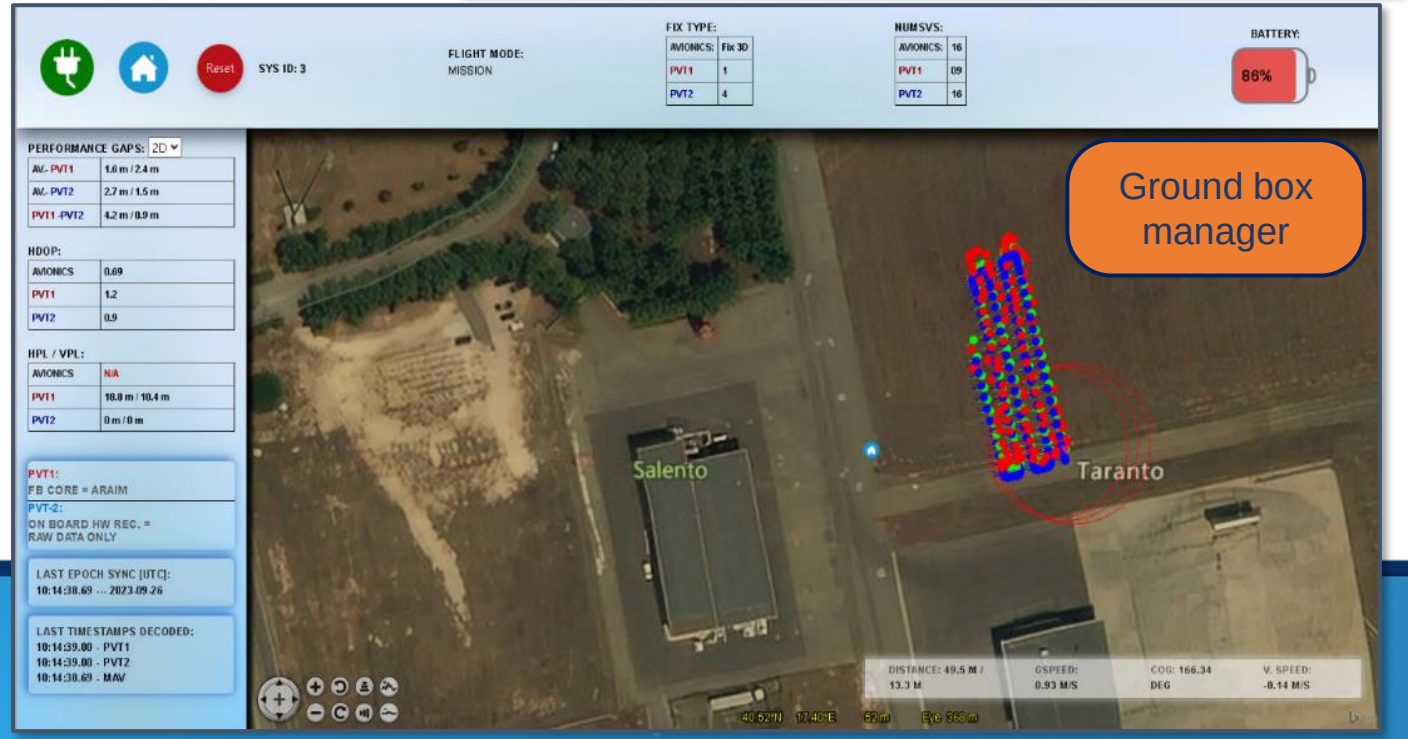
UAM National Test Facility

Post processing performance report

MQTT protocol

- The GAG provides the **integrity performance evaluation** (presented in the form of protection levels both on the *ground box manager GUI* and on the *EMS web interface*) of the drone exploiting the **ARAIM algorithm installed in the GNSS flying box core module**.
- The GAG provides the **GNSS performance assessment** of:
  - *A new PNT algorithm*, independently of its TRL. Installing the new PNT algorithm on the GNSS flying box it is possible to *test its capabilities at every level of implementation*, thanks to the different modules offered by the testing facility.
  - A *GNSS receiver* installed inside the flying box module working in an arbitrary mode.
  - All the abovementioned *performance assessment can be performed in both real-time and post-processing*, to provide the interested users with both a *qualitative and quantitative perspective on the GNSS performance* of the tested element.



Performance indicators, qualitative performance assessment

AV: Avionics
PVT1: ARAIM
PVT2: PPP-RTK

DTA & GATB: Flight Testing Facility and Capabilities

DTA (Distretto Tecnologico Aerospaziale) s.c.a r.l. is a private company and one of the most active aerospace technology clusters in Italy and works to increase the competitiveness of the Apulian aerospace system integrated into the global aerospace arena. **Planetek** and **Exprivia** are members of the Apulian cluster.

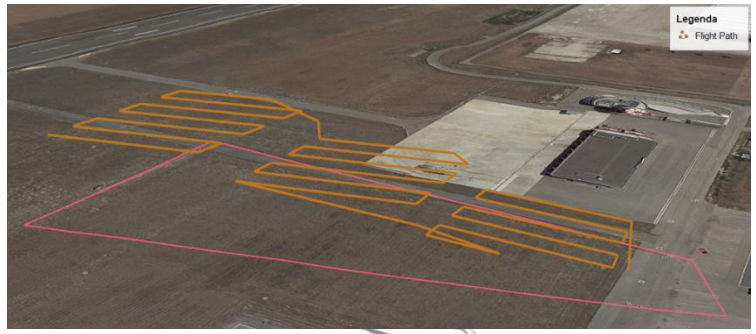
Within Aurora, the DTA operated at the **GATB infrastructure** located inside the Grottaglie airport “Marcello Arlotta” (LIBG), where several AURORA Demo and flight Trials have been executed. **GATB is one of three nodes of the Aurora National Testing Facility** with focus in the areas of: simulation, testing, research, education and training.

Laboratory Testing Capabilities

- Integration test of GNSS devices for insertion of RPAS in segregated air space. Interaction with ATM/UTM
- Airplane simulator, with ATM interface for test and validation of operational procedures and definition of flight scenarios.
- Drone simulator
- Hybrid CPU-GPU Datacenter, for simulation applications development and data analysis

Flight Testing Capabilities

- Drone Explorer 1000 able to embark payloads (max. 3Kg) for Flight Test
- Availability of a set of payloads (hyper-spectral, multispectral, lidar, thermal cameras, laser analyzers) for the development of applications and services via UAV
- Hangar for piloted aircraft and large drones and flight in restricted areas R148, R315, R316 and R317 (about 400 km^2).
- Radio Frequency Interference Monitoring Station for detection of possible interferents on L1, L2, E5 bands during flight activities and testing of on-board drone devices.
- Tracking of the aircraft/UAS being tested, using Electro-Optical trackers (CMOS cameras and Laser Range Finders). The tracking system allows the study of the performance of the UAS within the flight envelope and the analysis of the performance of UTM systems as it is a third measurement element.
- Drone data monitoring (Experiment Monitoring Station - EMS).
- Airspace surveillance, identification of cooperative (ADS-B) and non-cooperative objects via radar trace (X-Band Radar)
- Weather station, availability of local METAR and TAF weather data



DTA Testing capabilities – Experiment Monitoring Station

MAVLINK

GNSS

RFI

LIVE MONITORING

Repository

DEBRIEFING SESSION

Flight Plan Integration

Graphics

- Protection Level
- Sky Plot
- SNR Channel

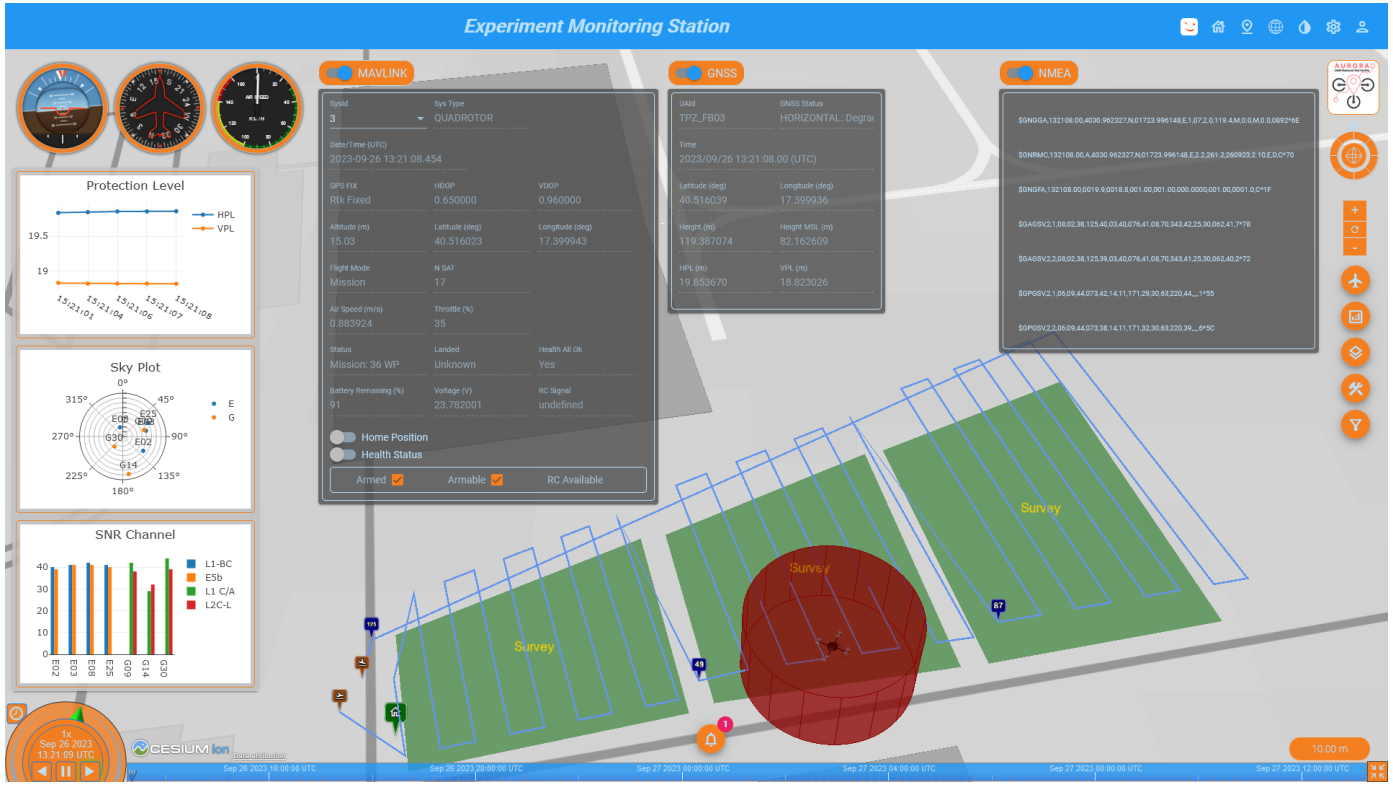
Timeline for Investigation

Data Report

- MAVLINK
- NMEA
- RF Messages
- Performance Data

Additional GIS Layers

Authentication & Authorization



DTA Testing capabilities – GNSS RFI Detection System

Detects radiofrequency disturbances during a test session and sends alerts to the Experiment Monitoring Station

1) Data acquisition

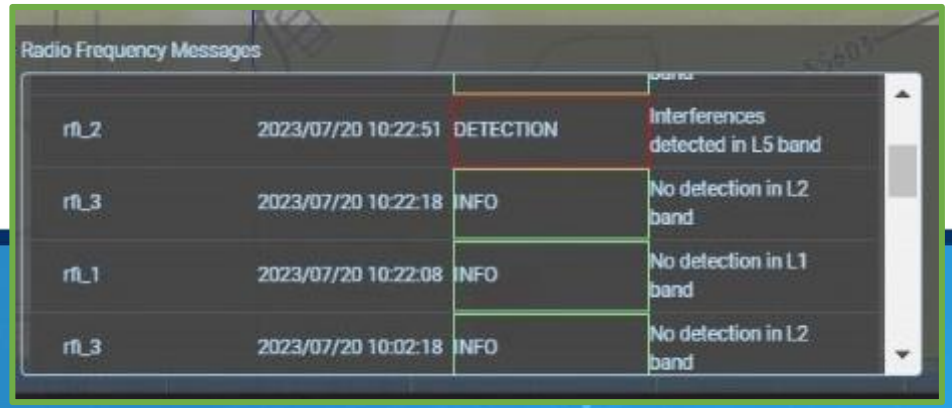
RFI monitoring station deployed at GATB on the roof of the control tower

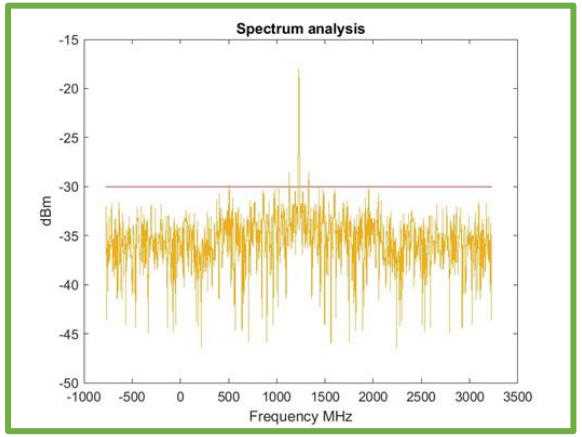
Web interface Management

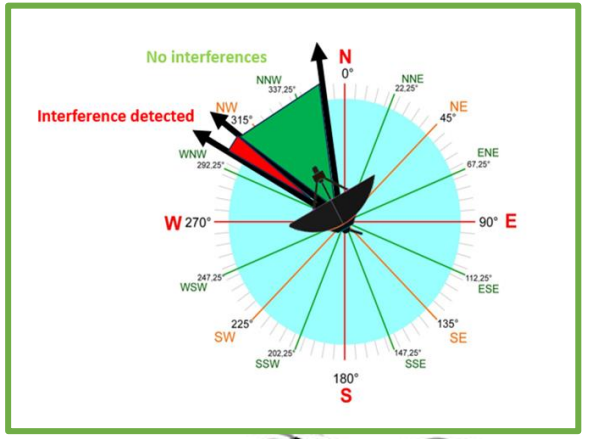
Parameters	Values
Start angle	312° NO
Stop angle	353° N
Skip angle	2°
Sampling Data rate	4 Mbps
Bandwidth	2 MHz
Data type	Real
Acquisition band	L1 L2 L5
Acquisition session time	1 Minute
Threshold value	-30 dBm

2) Data storage and processing

3) Results







4)Post processing

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Navigation Innovation Support Programme Element 3

AURORA PROJECT

itAlian Urban aiR mObility technologies

& distrRibuted test-fAcility

AURORA
UAM National Test Facility

TELESPAZIO
a LEONARDO and THALES company

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Lessons Learned Analysis Summary Results

Several lesson learned have been collected in the AURORA Phase 1 leading to several indications that can be summarized **at high level** as follow:

- The need to consolidate the operative scenario of the AURORA PNT Testing Facility has been identified, clearly identifying role and responsibilities and the operative processes, and the interfaces with the customers and even with other entities of the USSP.

- The need to review the requirements has been identified because of several discrepancies detected in the defined requirements, but also because there are missing requirements for the Communication Layer (the Network Management System).

- The preparation of dedicated architectural design documents for the Network Management System and for the Experiment Monitoring Station should be considered in Phase 2. As matter of fact in Phase 1 we have worked on this topic only at system level, differently of what has been done for the priority Building Blocks.

- The need to upgrade the Priority Building Blocks (and other elements) has been identified. As seen from the lessons learned, the implementation of new features is required to improve their performances and to fix the detected issues.

Contribution of the project to national strategy

Piano Strategico Nazionale of AAM and Roadmap 2021-2030, issued by ENAC is the results of National working group of public and private Stakeholders, aimed to create an Italian ecosystem for Advanced Air Mobility (AAM) common strategy.

Attachments to Piano Strategico Nazionale of AAM and Roadmap 2021-2030:

- **Roadmap AAM (2021-2030)**
- **Business Plan AAM (2021-2030)**

Some of the gaps and challenges contained in the Roadmap AAM are:

Technological challenges	*Need to develop onboard and ground safety and security systems exchanging data for communication/navigation with **U-Space**, **5G networks** and **GNSS** (e.g.**PNT**(position-navigation-timing)*
BVLOS operations	*Need to adapt **Global Navigation Satellite Systems** (GNSS)/ **Position Navigation and Timing** (PNT) to the urban environment & datalink*

AURORA contributes to bridging the gap and the challenge by meeting the following objectives:

- Define the PNT Requirements and Design a GNSS Based Architecture for Urban & Advanced Air Mobility (UAM/AAM)
- Implement a GNSS based PNT distributed testing infrastructure addressed to AAM/IAS needs.
- Investigate new PNT technologies for UAM applications

Approach to sustain the activities

- A reliable market analysis has to be performed to demonstrate the economic sustainability of AURORA. This analysis will be based on a survey with the main stakeholders, or on elaboration of a market model based on available data and application of top-down/bottom-up market approach.

- The market analysis should also consider the UAM/AAM standards that are applicable at national level to navigation services.

- In our approach the market analysis activities are divided into the following two groups:
  - Activities of market analysis, to be carried out in the next three months, necessary to obtain ESA's technical OK for the start of the Phase 2 Proposal.
  - Subsequent activities of Business Model and Business Plan definition, to be included in the AURORA Phase 2 Proposal.

ID	Activity	Start	End	Duration
1	Analysis of AAM/UAM reference market in Italy	01/02/2024	29/02/2024	21g
2	Identification of market drivers and constraints	01/02/2024	29/02/2024	21g
3	Analysis of the National Regulatory Framework for the AAM/UAM navigation services	01/02/2024	15/03/2024	32g
4	AURORA Test Capabilities and Services	08/01/2024	29/02/2024	39g
5	Stakeholders Identification (public/private)	08/01/2024	29/02/2024	39g
6	Identification of potential customers	08/01/2024	29/02/2024	39g
7	Survey Execution (Stakeholders interview, Questionnaire Definition and Distribution, Survey Results analysis) or market analysis (bottom-up and top-down approach), based on available data, and validated with interview with potential Customers	01/03/2024	30/04/2024	43g

Benefits of working with ESA

The AURORA Project is done as part of the NAVISP Programme Element 3 and therefore it can benefit of all the advantages that ESA can offer, like :

- Having a technical guidance according the space standards, and toward a European common goal
- Having the possibility to publicize the entities involved in the project, their activities and the project goals and results (as for example we are doing with the webinar)
- Being part of the European PNT solutions research and development community, with the possibility to share experiences, results and lesson learned
- Have a window open on new opportunities (from both financing point of view or collaborations possibilities)
- Creating commercial opportunities connecting the user needs with the developed solutions
- Fostering international collaboration

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MANY THANKS

FOR YOUR ATTENTION!

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