F-35 introduces artificial intelligence: enhanced threat recognition capability

Published on 01/03/2026

At the end of February 2026, Lockheed Martin announced the successful completion of a test flight of the F-35 Lightning II equipped with a new artificial intelligence-based feature. The demonstration, named Project Overwatch, took place at Nellis Air Force Base, a reference center for advanced training of the U.S. Air Force.

According to the company, this is the **first in-flight application of a tactical AI model** capable of generating autonomous identification displayed directly on the pilot's screens. The system was developed with the aim of **improving speed and accuracy in threat recognition**, intervening in the management of information flows generated by onboard sensors.

A fifth-generation fighter operates in complex environments characterized by a high density of electromagnetic emissions. Radars, communications, and data link systems produce a significant amount of information that must be analyzed in very short times. Project Overwatch

uses a machine learning model trained to analyze radio frequency emissions and **support emitter identification**.

Processing takes place directly on board the aircraft, ensuring operational continuity even in scenarios characterized by high technological intensity. This integration strengthens the concept of functional autonomy of the platform.

Speed of update and operational adaptation

One of the most significant elements of the project concerns the **rapid update capability of the AI model**. Through automated tools, it is possible to label new emissions, retrain the system in short times, and load the updated version before the next mission.

This setup allows the aircraft to maintain a high level of effectiveness even in the presence of technological evolutions in radar and communication systems. In a dynamic operational environment, the ability to adapt is an essential factor to ensure performance continuity.

F-35's onboard interfaces and systems: the digital architecture allows for rapid software updates and continuous integration of AI capabilities. Source: Lockheed Martin / U.S. Air Force

The F-35 was designed as a platform centered on data fusion. The distributed sensors and integrated digital architecture provide the pilot with a synthetic and coherent view of the operational context. The integration of artificial intelligence in Combat Identification helps to **optimize the decision-making process**, reducing analysis times and improving situational awareness.

Project Overwatch was developed as part of the company's internal research and development activities, confirming the constant focus on the evolution of the platform's software capabilities.

Technological evolution and operational prospects

The introduction of artificial intelligence on the F-35 is part of the broader process of transforming military aeronautical capabilities, increasingly oriented towards the integration of sensors, networks, and autonomous systems.

In this context, **the speed in identifying and classifying threats** plays a central role. Reducing the time needed to interpret a radar signal or communication improves the overall effectiveness of the mission and the management of available resources.

F-35 in flight in operational configuration: integration between sensors, networks, and digital capabilities at the center of the platform's evolution. Source: Lockheed Martin / U.S. Air Force

For the countries using the platform, the continuous evolution of software capabilities represents an element of operational stability in the medium-long term. The "software-defined" nature of the aircraft allows for the progressive integration of new functionalities without structural interventions on the airframe.

Artificial intelligence is configured as a **support tool for the pilot**, integrated into decision-making processes and aimed at improving the quality of available information. The test conducted at Nellis thus highlights a clear evolutionary trajectory: a platform that combines aerodynamic performance, advanced sensor technology, and algorithmic capabilities to effectively respond to contemporary operational needs.

News link: https://www.hdblog.it/tecnologia/articoli/n649721/f35-ai-project-overwatch/