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AlarisPro Awarded NASA SBIR Phase II to Advance AI-Powered Digital Twin Technology for Predictive UAS Maintenance and Safety

Twenty-four-month Program Advances AlarisPro's AISR Digital Twin Toward Operational Demonstration for Real-Time Aircraft Health Intelligence, Predictive Maintenance, and Prescriptive Decision Support

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AlarisPro

October 27, 2026

Maryland, USA - AlarisPro, the industry leader in UAS fleet management, safety, reliability, and continued airworthiness, has been awarded \$1.275M in Phase II funding through NASA's Small Business Innovation Research (SBIR) program to advance its AI-Enhanced Safety and Reliability (AISR) Digital Twin framework. The 24-month program moves validated Phase I feasibility work toward an operational demonstrator that turns UAS telemetry and historical reliability data into predictive, actionable safety intelligence.

Over the years, fleet and asset management have evolved in stages. Most systems today can tell operators *what happened*. A growing number can tell them *what is happening right now*. But to date, the UAS industry has not demonstrated a consistently reliable capability to predict **what is about to happen** particularly at the aircraft, subsystem, and component level. Closing that gap represents one of the most significant opportunities for the next generation of UAS reliability, predictive maintenance, and aviation safety software. *"That is the problem we are solving,"* said Anthony Pucciarella, Founder and CEO of AlarisPro. *"As UAS operations move toward routine BVLOS and fleets scale, regulators, operators, and OEMs need reliable, component-level insight into what is likely to happen next - and what action to take before aircraft availability or safety is affected."*

Moving UAS Maintenance from Reactive to Predictive

AlarisPro is both the category creator and category disruptor for the UAS predictive-maintenance category. AlarisPro is positioned to establish first-mover leadership by transforming its existing component reliability and continued-airworthiness platform into the industry's first predictive maintenance intelligence layer.

NASA's SBIR Phase II award is not simply a stamp of approval; this funding supports the build-out and operational validation of AlarisPro's core AI and Digital Twin technology: the

AISR Digital Twin, live telemetry processing, Prognostics and Health Management (PHM), and the AI/ML engine designed to detect anomalies, model degradation, and predict potential failures before they occur. AlarisPro's Phase I work earlier in 2026 validated the architecture on real flight data from two UAS platforms and demonstrated cross-platform modularity across different aircraft and subsystems.

Building and Validating the Predictive Engine

Phase II advances the Phase I prototypes into an operational system spanning onboard real-time health estimation and PHM, operator-facing alerts and maintenance recommendations, and a global intelligence layer that mines the AlarisPro Data Lake for cross-fleet patterns and model improvements.

That architecture directly supports NASA's In-Time Aviation Safety Management Systems (IASMS) vision: continuous monitoring, predictive awareness of potential failures, and decision support for proactive risk mitigation.

For customers, the same predict-and-prescribe architecture is intended to identify reliability concerns earlier, focus maintenance on genuine degradation risk, improve aircraft readiness, and strengthen evidence supporting continued airworthiness.

"The opportunity is to turn operational data into intelligence that operators can use before a discrepancy becomes an interruption or a safety event," Pucciarella said. "That is the shift to true predictive maintenance."

"Phase I demonstrated that our approach has the potential to work across very different aircraft and operating environments. Phase II gives us the opportunity to advance that foundation much further," Pucciarella continued. "Our goal is to help operators move beyond understanding what has already happened and toward understanding what may happen next. That shift has enormous implications for aircraft availability, maintenance planning, operational safety, and the future of advanced UAS operations."

Why Predictive Maintenance Matters for AlarisPro Customers and BVLOS Scaling

As the industry moves toward routine Beyond Visual Line of Sight (BVLOS) operations, aircraft reliability and continued airworthiness become increasingly important to safe, scalable operations. Scheduled inspections, disconnected records, and post-flight analysis alone cannot provide the aircraft-health awareness these missions require.

The AlarisPro AISR Digital Twin is designed to help close that gap through onboard PHM, severity-ranked alerts, and structured continuing-airworthiness evidence that give

operators, OEMs, and regulators objective, traceable information about emerging degradation before a failure occurs.

For operators and OEMs, the ability to identify emerging component degradation before it results in an in-service failure can transform maintenance from a reactive obligation into a proactive operational advantage, supporting better maintenance planning, increasing aircraft availability, reducing unplanned disruptions, and providing greater confidence that each aircraft can continue operating within a reliable safety envelope as fleet utilization and mission complexity grow.

AlarisPro also enters Phase II with a decade-built foundation of aviation reliability knowledge and data, component performance insights, maintenance intelligence, and operational experience. Combined with live telemetry, this extensive historical foundation provides the Global AI/ML Intelligence Engine with the context needed to improve model fidelity, identify potential failure precursors earlier, and generate increasingly precise maintenance recommendations.

In short, the NASA SBIR Phase II award is a major, independently validated AI milestone on AlarisPro's path to reliable predictive accuracy. The core modeling techniques, data infrastructure strategy, and predict-and-prescribe architecture being built and proven under this program are the same building blocks the company is extending across its broader system-of-systems customer base - forming the foundation for AlarisPro's goal of delivering the first validated, platform-agnostic predictive maintenance solution for UAS.

From NASA Research Toward Operational Reality

The 24-month Phase II effort will expand onboard subsystem coverage, advance hybrid AI/ML and PHM models, integrate operator-facing decision support, operationalize cross-fleet pattern intelligence, and culminate in an IASMS-aligned operational demonstration and NASA transition package.

Beyond NASA, the same foundation creates a commercial pathway for UAS operators, OEMs, MRO providers, insurers, regulators, and other stakeholders - delivering earlier component-health insight, more proactive maintenance decisions, and stronger reliability evidence as operations scale.

"NASA's continued investment is significant for AlarisPro and the broader UAS industry," Pucciarella said. "It helps move predictive safety intelligence toward operational use as fleets grow and routine BVLOS operations emerge. We believe this capability can become a critical part of how advanced UAS are operated and maintained safely."

About AlarisPro

AlarisPro is the industry leader in UAS fleet management, safety, reliability, and continued airworthiness. The AlarisPro platform provides operators and manufacturers with a comprehensive framework for managing aircraft configuration, maintenance, safety, personnel, documentation, and operational data within a single aviation grade environment. Through its proprietary Digital Twin technology and unique fleet wide reliability intelligence, AlarisPro helps organizations improve aircraft availability, strengthen safety, support regulatory readiness, and confidently scale advanced UAS operations.

Learn more at AlarisPro.com.

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