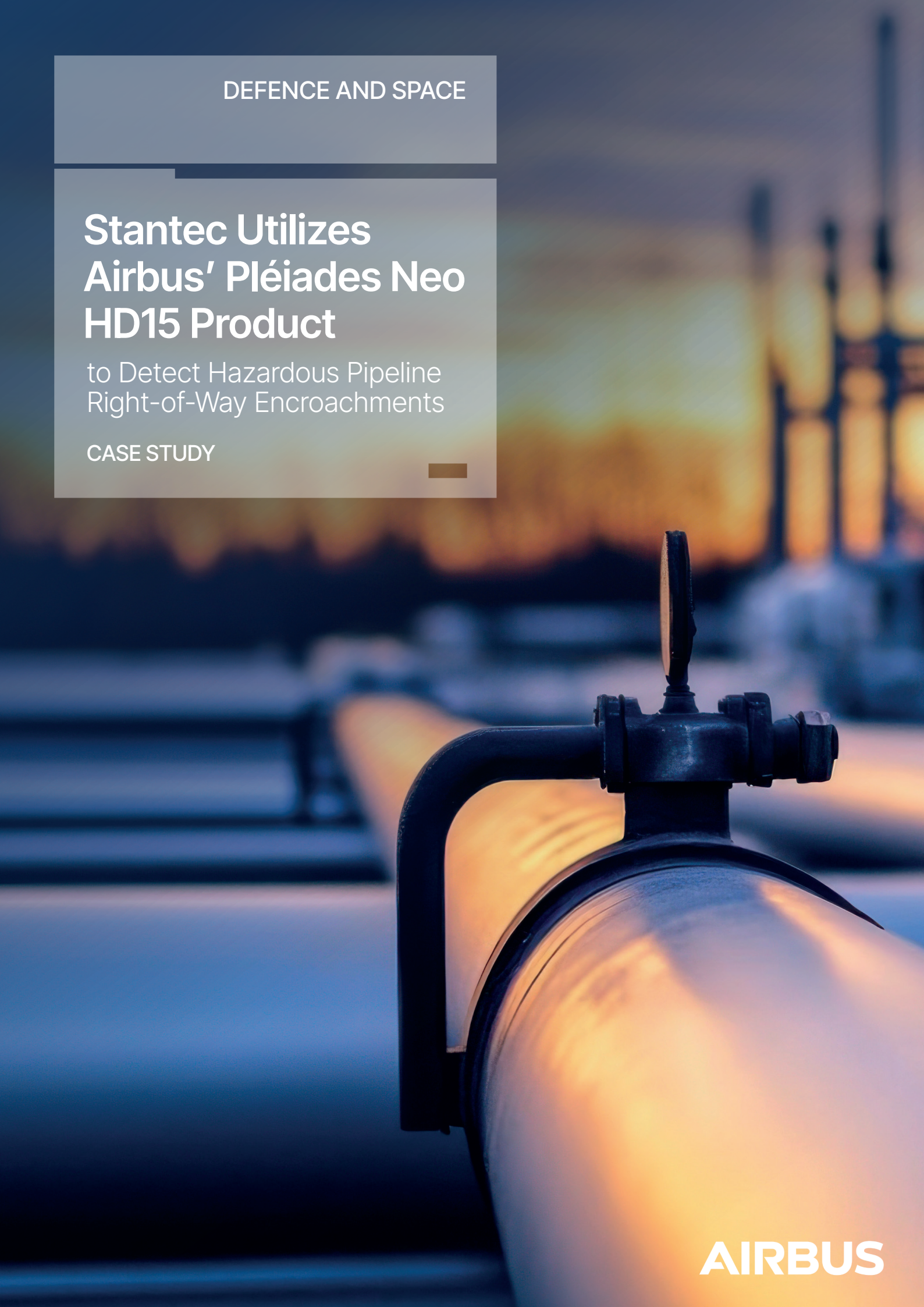
DEFENCE AND SPACE

Stantec Utilizes Airbus' Pléiades Neo HD15 Product

to Detect Hazardous Pipeline Right-of-Way Encroachments

CASE STUDY

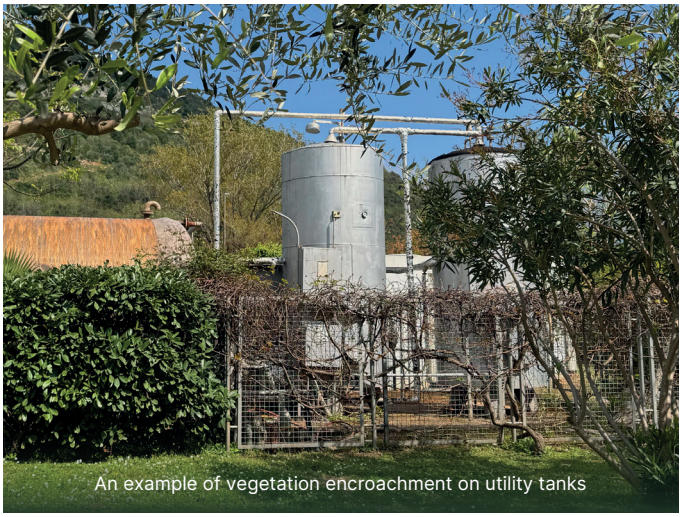


AIRBUS

A global engineering, architecture, and design firm has incorporated Pléiades Neo HD15 products into its pipeline right-of-way monitoring service to identify third-party encroachments that could threaten the safety of buried hydrocarbon lines. In just the first implementation of the encroachment service, a potentially catastrophic situation was identified and remediated before damage was done to the underground pipe or surrounding neighborhood.

Stantec provides a variety of engineering-related services from its Edmonton, Alberta, Canada, headquarters and worldwide offices to clients in energy, transportation, government, construction and other fields. Many of these services leverage geospatial technologies to deliver timely, cost-effective solutions to end users. One of these offerings is Stantec PipeWATCH, a service rendered to the oil and gas industry by the firm's Digital Center of Excellence. PipeWATCH utilizes high-resolution multispectral satellite imagery to monitor a client's right-of-way, sometimes totaling thousands of linear kilometers, on a regular schedule with one of two primary objectives. The first is to detect leaks in the pipeline itself, which are usually indicated by stress in the surrounding vegetation, identifiable with near-infrared imagery. The second is vegetation growth into the right-of-way, which could interfere with safe operations.

Recently, however, a client requested Stantec expand its monitoring service to detect physical encroachments by third parties on its underground pipeline. Of concern was a major segment of the company's high-pressure hydrocarbon line that snaked its way through a densely populated region of Southern Ontario. The client wanted to be notified of encroachments in the right-of-way as well as a 50-meter buffer to either side.



An example of vegetation encroachment on utility tanks

Looking for Physical Encroachment

For many of its geospatial and remote sensation services, like PipeWATCH, Stantec relies on SkyWatch of Ontario, Canada, to obtain and deliver satellite imagery. SkyWatch is an aggregator of geospatial data making more than 700 data sets from numerous sources available to customers like Stantec via an online portal where products can be searched, ordered, and downloaded. The Montreal firm even handles tasking of new satellite imagery through its APIs for customers.

From an object encroachment perspective, the Southern Ontario assignment presented a new challenge to the Stantec pipeline monitoring service because there were numerous objects and activities that could potentially be found in the right-of-way corridors. Unauthorized construction and trash dumping were common problems.

Even more challenging, Stantec realized that its analysis would also have to include looking for evidence of impending encroachment. An example of this would be a ground disturbance that could indicate some sort of excavation was taking place. A different, but related example, could also be soil tilling on any of the many nearby farms that could mean agricultural activity was creeping into the corridor. Due to the need for a high level of image detail in this project, Stantec chose to use the HD15 product created specifically for monitoring applications where visual identification of small objects is critical. HD15 is derived from Pléiades Neo imagery by upscaling the native 30cm pixels to 15cm with a proprietary AI-Airbus algorithm that intensifies information content by enhancing details, linear features, and brightening colors.

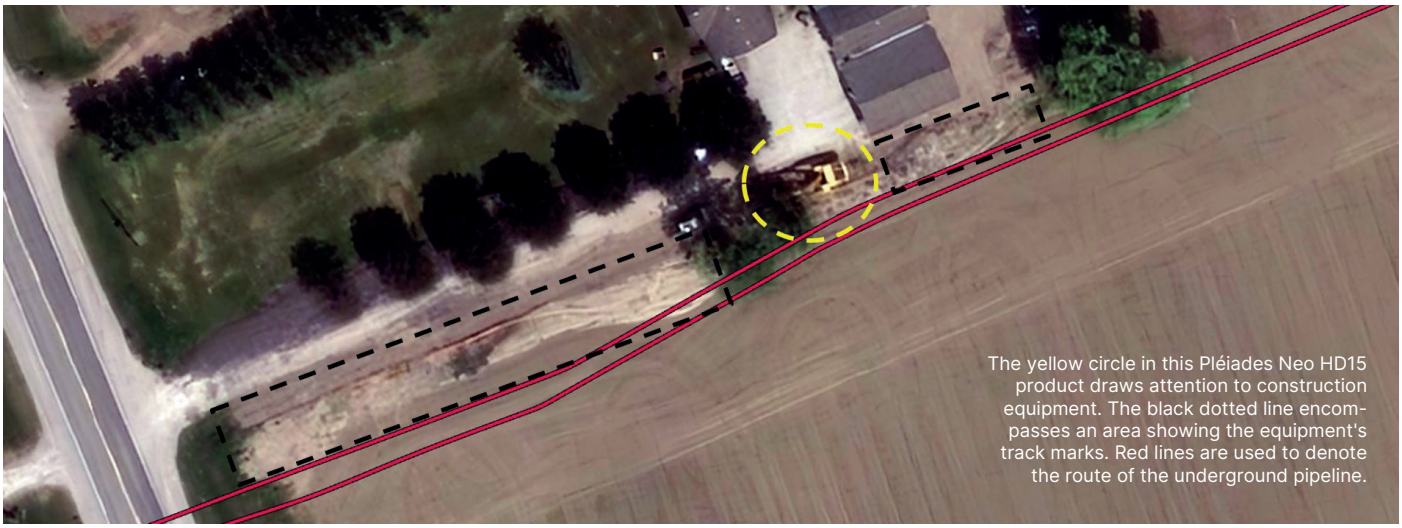
"The client was looking for a cost-effective solution to monitor this stretch of pipeline to ensure the integrity of the line was safeguarded. [There was] human activity that was occurring too close for comfort in the right-of-way."

Grant Wiseman, Stantec Geospatial Manager

"Unlike conventional upscaling that artificially enhances pixel resolution, the non-generative Airbus algorithm performs image restoration on the 30cm Pleiades Neo data to generate HD15 data with reliable accuracy and precision – without generating artifacts," said Laurent Gabet, Head of Research & Development within the geospatial division of Airbus. "The result enables high-quality automated object detection, feature extraction, and change analysis."

Stantec has scheduled a monthly collection of HD15 data sets covering the Southern Ontario right-of-way, which is delivered via the SkyWatch platform, for use in automated change detection analysis in Stantec's PipeWATCH workflow. Since the monitoring began in 2023, the service has detected numerous encroachments that triggered email alerts to the pipeline operator. While waste dumping and farming activities have been flagged, the most serious threats involved non-permitted placement of backyard sheds or similar construction by a private landowner whose property abutted the pipeline corridor.

"Unfortunately, there are some people who don't go through the proper permitting processes,"



The yellow circle in this Pléiades Neo HD15 product draws attention to construction equipment. The black dotted line encompasses an area showing the equipment's track marks. Red lines are used to denote the route of the underground pipeline.

Explaining this official procedure notifies landowners of potential right-of-way conflicts. The most dramatic incursion revealed thanks to the HD15 imagery, however, was the presence of a piece of construction equipment in the buffer zone.

> *"Because the imagery was such high resolution, we could actually see the machine's tracks in the dirt and where holes had been dug [in the right-of-way],"*

For most PipeWATCH red flags, Stantec uses an auto-report system to email information to the client along with a supporting image extract and precise location coordinates of the problem. But for the earthmoving equipment sighting, Stantec called the operator's emergency phone number so that immediate action could be taken. In that case, the operator sent a crew to assess the scene in person and make contact with the landowner in question.

> *"We had the GIS drawings of exactly where the underground pipeline was…and the situation was high alert," said Wiseman, noting the incident was quickly resolved. "The client was appreciative we found [the earthmoving equipment] as soon as we did because we likely avoided a potential disaster."*

Building on the success of the project in Southern Ontario, Stantec has now included the encroachment monitoring as a regular offering in its PipeWATCH service.

About Stantec

Stantec empowers clients, people, and communities to rise to the world's greatest challenges at a time when the world faces more unprecedented concerns than ever before.

We are a global leader in sustainable engineering, architecture, and environmental consulting. Our professionals deliver the expertise, technology, and innovation communities need to manage aging infrastructure, demographic and population changes, the energy transition, and more.

Today's communities transcend geographic borders. At Stantec, community means everyone with an interest in the work that we do - from our project teams and industry colleagues to our clients and the people our work impacts. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We are designers, engineers, scientists, project managers, and strategic advisors. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible. Stantec trades on the TSX and the NYSE under the symbol STN. Visit us at Stantec.com or find us on social media.

About SkyWatch

SkyWatch is on a mission to make remote sensing data more accessible and usable for businesses, researchers, and developers.

The SkyWatch platform simplifies how organizations discover, acquire, and use this valuable data through an ecosystem of applications built for different user needs:

EXPLORE – A user-friendly visual interface that allows users to browse a vast catalog of remote sensing data, compare options, and acquire the imagery they need.

MAP – A seamless solution for geospatial professionals to integrate satellite imagery into the mapping tools they use every day, including ArcGIS, making it easy to overlay and analyze remote sensing data within existing workflows.

HUB – A centralized platform for businesses to manage their remote sensing data procurement, usage, and storage, HUB provides a single access point for acquiring, organizing, and tracking satellite imagery across teams and projects.

BUILD – A developer-friendly suite of tools that provides seamless access to satellite imagery through a robust API, making it easy to integrate remote sensing data into applications, analytics tools, and industry-specific solutions.

By providing seamless, scalable, and cost-effective access to satellite imagery, SkyWatch is enabling businesses and professionals to harness the power of space-based intelligence like never before.

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