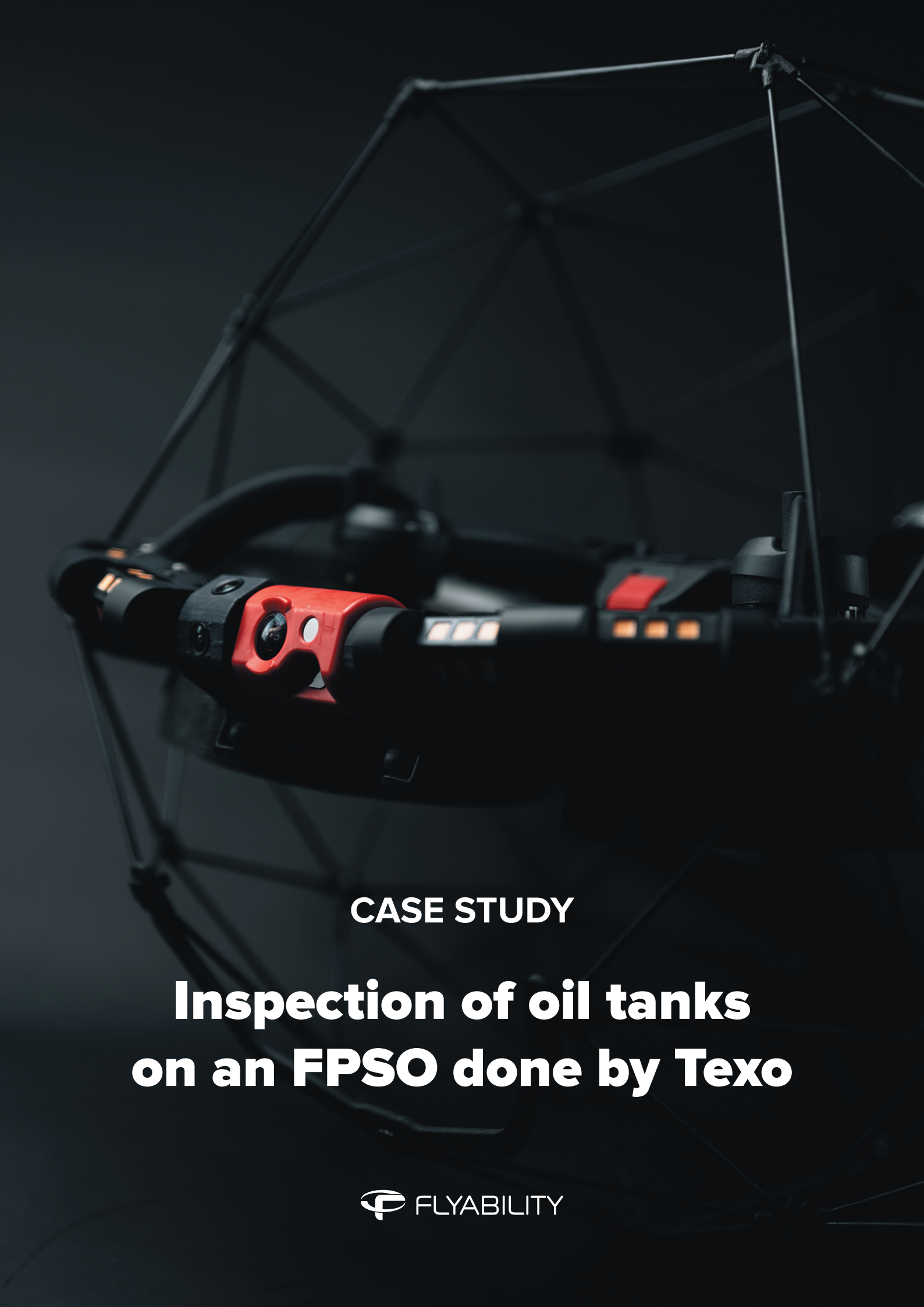


CASE STUDY

Inspection of oil tanks on an FPSO done by Texo

FLYABILITY

TEXO maximizes value with Elios drones, offering location referencing, point clouds, and eliminating confined space risks.

Benefits in a nutshell

Savings

Traditional inspections require 4 to 5 rope access technicians. These technicians must wait to be deployed until the tanks are emptied and cleaned. Inspection takes up to 7 to 10 days, representing significant labor costs in addition to the more expensive loss in production while the tank is out of use. Inspection with Elios 3 takes 2 people 2 Days per tank, reducing both labor costs and production loss.

Speed

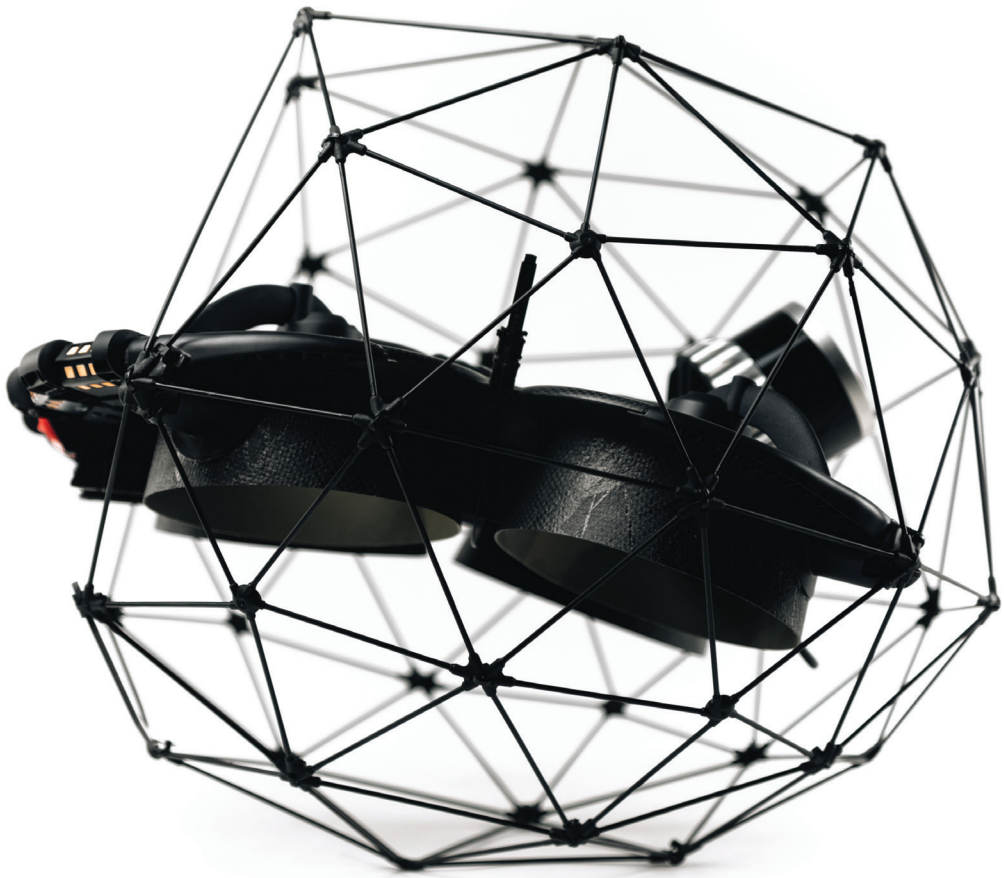
Traditional means of inspection can require up to 7 to 10 days per tank. Inspection and data processing for the Elios required only 2 Days per tank. Because inspectors were able to look at vulnerable areas first to identify any problems, maintenance was also performed in a shorter time frame.

Safety

Oil tank inspections are dangerous, requiring 4 to 5 rope access technicians to work at height for long periods of time. Using the Elios, pilots are able to stay outside of the tank safely on the ground.

Operations

Drone inspection takes 2 personnel, this is an overall reduction on bed space requirements when compared to the rope access inspection. As FPSOs typically operate with tight restrictions on POB, this allows the operator to free up bed space for other essential works.



Introduction

Floating production, storage, and offloading vessels – FPSOs – offer effective and flexible infrastructure for offshore oil production operations. These huge ships can process and store oil until it can be transported by tanker or pipeline. They are easy to install and can be relocated as required to optimize a production portfolio.

FPSOs have a high development cost, but a long lifespan because they can be relocated as required and used well beyond the life of a single production facility if maintained.

Typically, the processing equipment is located above the vessel's deck, while oil storage is located below the deck in the double hull.

These vessels hold a crew of between 50 – 70 people. For safety and environmental reasons, the vessels must be inspected and certified every few years on a regular basis.

Customer needs

Inspection experts TEXO were asked to perform an inspection on the oil tanks in an FPSO.

A vessel in dry dock can be inspected relatively easily by setting up scaffolding and utilizing a large team of inspectors: but inspecting an FPSO in station is much more difficult and time consuming. Oil tanks cannot be emptied all at the same time for efficient inspection: both because the vessel must be balanced for safety and for continuity of operations. Generally, operators make 2 tanks available at a time: simply preparing the tanks for inspection can take weeks. Tank inspections traditionally require 4 to 5 rope access technicians, who may be left waiting for several weeks to be deployed while the tanks are prepared.

When the tanks are available for inspection, rope access work is dangerous and time consuming: In some cases, scaffolding may be required. Scaffolding introduces new risks: in addition to the danger to the staff working at height, scaffolding can cause damage to tank coatings and dropped objects can contribute additional risk to the tank and the personnel.

While the labor is expensive, TEXO points out that the production slowdown while the tanks are unavailable is even more costly. The inspection is a certification requirement and promotes preventative maintenance: workers look for distortion, defects, buckling, and cracks, especially in toe wells and other high stress areas. Any problems found must be addressed during the process, adding more downtime if the defect is found late in the inspection process.

Solution

Solution

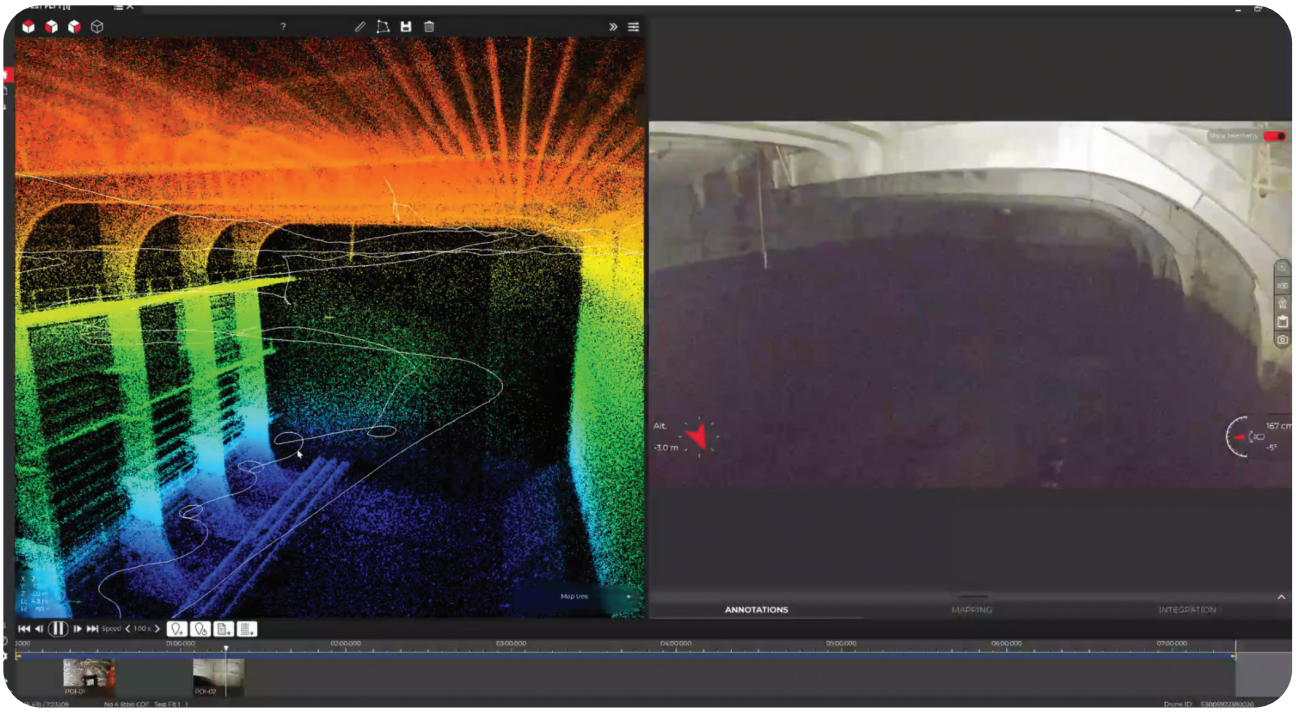
TEXO utilized the Elios 3 to perform the oil tank inspection in one week after the emptying and cleaning process, with a team of only 2 people. With the pilot located safely outside of the tank, TEXO says that there is virtually no risk to the personnel. The team performed 4 flights to map the tank, and then created a 3D point cloud of the asset.

TEXO reports that the Elios solution represents a very significant savings in cost – but also offers better, more reliable data for repair and maintenance.

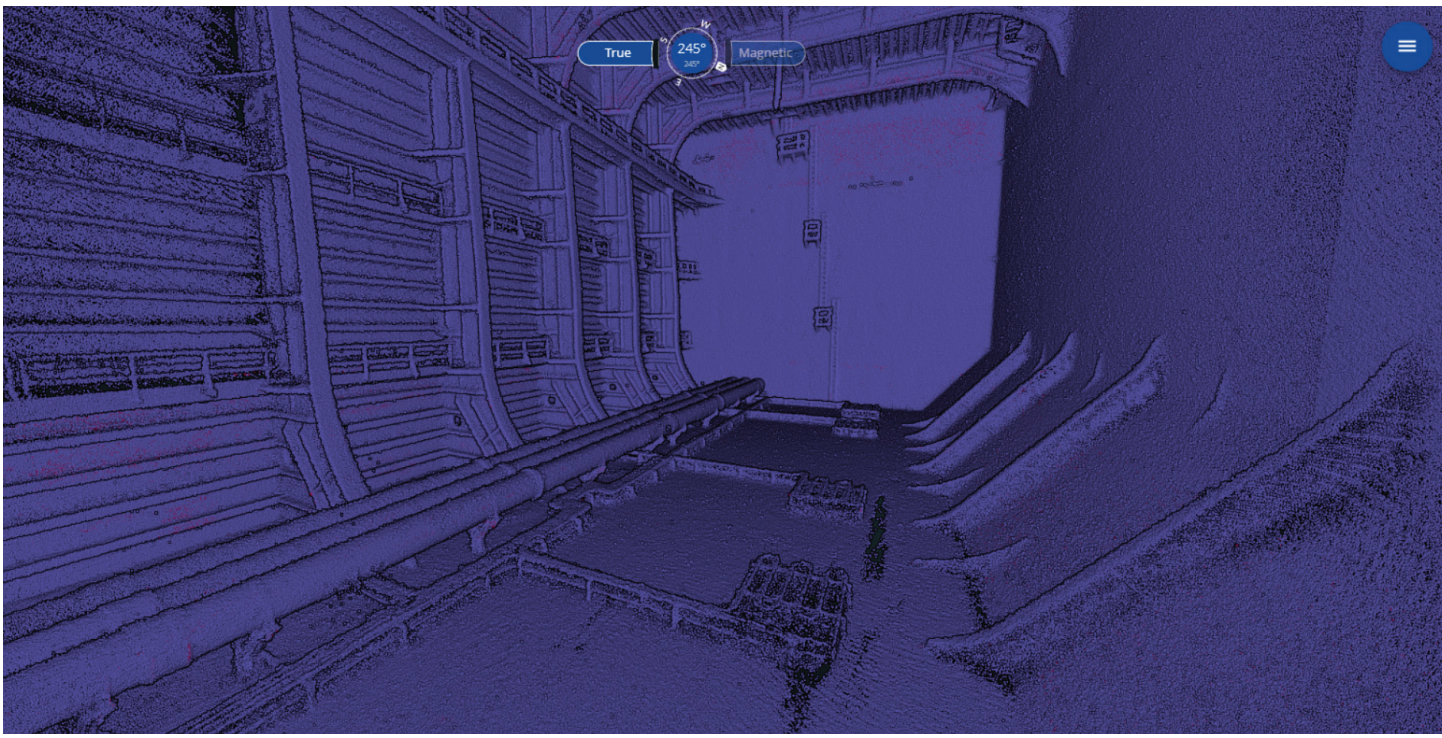
“Elios is such a good tool that it really just requires 2 people, versus 5 people for many days,” says TEXO’s Xiang Wong. “But also, it gives the surveyors on shore a lot of confidence that the entire tank has been inspected. Utilizing the flight trajectory ensures teams have not missed any of the highly repetitive structure.”

Using rope access teams, says Xiang Wong, “You have to put your entire faith in the team that is working for you, because all of the pictures look the same. With the Elios 3 you can track where you have been – you have the video continuity. That’s a major benefit. A single set of data can be reinvestigated by multiple inspectors all with their own experience adding layer upon layer of expertise to it.”

The Elios 3 solution also allows the TEXO team to become more efficient in maintenance, to minimize downtime and the related costs. “With drones, you can inspect critical points, hot spots, or stress concentration areas first, and identify any problems right away,” Wong explains. “When you have identified a defect early on, you can work with the naval architects and surveyors to develop a solution while the tanks are still empty.”



The steam heating coils found on the bottom or sides of the tank offer a particularly good case in point. Heating elements form a dangerous environment and are fragile and easily breakable. Human inspectors are not always able to identify the exact source of a problem: flying a complex pattern with the collision-proof Elios solution and creating a point cloud representation of the system allows engineers to identify a problem more easily. Point cloud data can be merged with topside data to form a complete picture of the tank, helping engineers to identify the correct placing of any cut into the tank for repair.



Results

TEXO was able to provide their client with an accurate inspection, including point cloud data that was previously unavailable. The inspection was performed in only 4 days, compared to a usual timeframe of up to 2 weeks and the client feedback was positive. The client is now interested in pursuing further use of the Elios solution for FPSO inspections.

The Elios inspection provided the inspection with no risk to personnel, and was able to offer onshore surveyors complete confidence that the entire area had been reviewed.

Conclusion

TEXO sees significant value in using the collision-proof Elios solution for a variety of oil and gas inspection projects. The TEXO team has used both Elios 2 and Elios 3. While Elios 2 offers many benefits over traditional rope access inspection, TEXO cites the advantages of location referencing and point clouds using Elios 3. **"If there are no problems in an inspection, the Elios 2 is great,"** says Xiang Wong. **"But for fixing issues, the Elios 3 is needed."** In future, TEXO is looking forward to exploring further use cases, like semi-submersible vessels. **"Semi-submersibles are almost like a maze to navigate,"** Wong explains. **"The Elios 3 is the perfect tool for that. Elios really negates the need to put men in confined spaces."**

TEXO Group is certified DNV (Det Norske Veritas) as a service supplier approved for surveying using Remote Inspection Techniques (UAV) as an alternative means for a close-up survey of the structure of ships and mobile offshore units.

Learn more on our website.