FLANNERY®

FOCUS ON INNOVATION

People Safety **Innovation** Sustainability Value

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Showcasing 3D Avoidance

OVERVIEW

Working together to make a total solution on site, Flannery Plant Hire, Leica Geosystems, XWatch Safety Solutions and Flannery Plant Hire are providing a way to remove risks associated with avoiding hazards on site. This is the first time that companies have come together to find an actual working solution for a modern-day construction site, creating a reactive solution for a dynamic problem.

There have historically been a number of hazards that the industry has faced when using plant on site, and these obstructions aren't always visible.

In the UK alone, there are over 4 million kilometres of underground pipes and cables.

Due to the data of where these are being hard to access, there are currently nearly 60,000 accidental strikes of these occur each year. These incidents can cause a risk to the safety of on-site personnel and machine operators, as well as causing delays that then impact project time and budget. In fact, incidents such as this are costing the UK economy around £2.4billion annually.

This equipment isn't limited to only reducing collision risks with objects, but it also works to reduce People Plant Interface (PPI), which is widely recognised as one of the key fatal risks within construction.

Working with utility survey equipment, we can now measure the exact position and even depth of underground hazards. Using the National Underground Asset Register (NUAR) collection over 650 asset owner information on an interactive map, developed by the Geo-Spatial Commission, allows us to gain information about where potential buried hazards are underneath the ground.

Currently, this 3D Avoidance System is available exclusively on Flannery excavators, enhancing our offering to clients for a complete package that considers all health and safety needs.

FIND OUT MORE ABOUT 3D AVOIDANCE

THE PROJECT

Flannery Plant Hire is working with Kier on the National Highways upgrade of the A585 near Preston in Lancashire. It's a 4.85km stretch of road that currently deals with 3,000 vehicle movements per hour at peak times. Three new bridges are planned.

3D Avoidance is suited for this work due to working in close proximity with moving traffic, as well as overhead obstructions. Learning from past mistakes, Kier saw the need for a smarter solution to take away the risks involved when operating plant in such circumstances.

INNOVATIONS

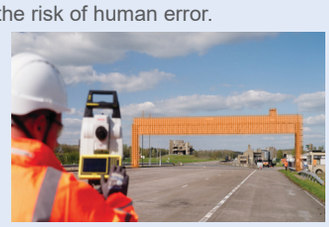
Safety has no limitations, and this solution can be used across a number of scenarios. With engineers attending site before plant works begin to map out hazards that can then be pre-uploaded into the in-cab system, the onus can then be taken off the operators for them to be able to avoid hazards effortlessly – reversing the normal trend with innovations where the functions rely heavily on the operator. Here are some examples of hazards that can be avoided:

Height Restrictions: In situations where the excavator is in danger of hitting an overhead obstruction, such as power lines or a gantry, these can be quickly created or imported as avoidance zones from the cabin controls. Once the system is triggered, the hydraulic functions of the excavator can be slowed down or even brought to an entire stop.

Zone Restrictions: We also can disable the excavator tracks' motion to stop any environmental or drainage trench breaches, for example. If you can survey it, you can avoid it.

Underground Restrictions: Using the National Underground Asset Register, we able to enable control and safely excavate around services for power, gas, water and other potentially hazardous products buried beneath the surface. We can now set limits on dig depth to protect these assets and allow safe excavation when required. If you can map or detect it, you can avoid it.

Highway Restrictions: We can set a pre-determined geospatially placed avoidance zone or virtual wall when working on live carriageways and public roads. We can now stop the excavator from breaching these areas and, importantly, the excavator's tracks. This system doesn't knock the slew system off when travelling forward, so no reset is required. It takes away the risk of human error.



CASE STUDY:

The engineering is pivotal for this to work – the operator is now collaborating with the technology to create more than a 'that'll do' scenario, but instead a scenario in that, once parameters are set, they can't be overridden. Co-ordinates don't move, so all these hazards are marked exactly where we want them to be. This solution combines the Leica Geosystems MC1 machine control software and XWatch Safety solutions. It has been under a collaborative testing approach in the UK for some time, and we've had great results recently testing it on Kier sites. Working as a group to such results does really prove that we are stronger together.

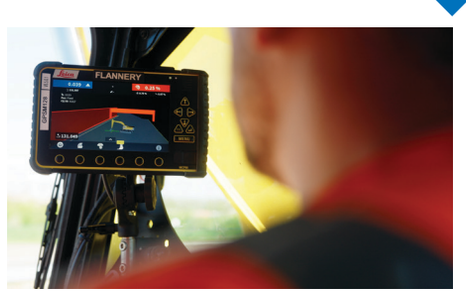
Liam Hills, Senior Plant Trainer at Flannery, has been testing the system across various scenarios from an operator perspective:

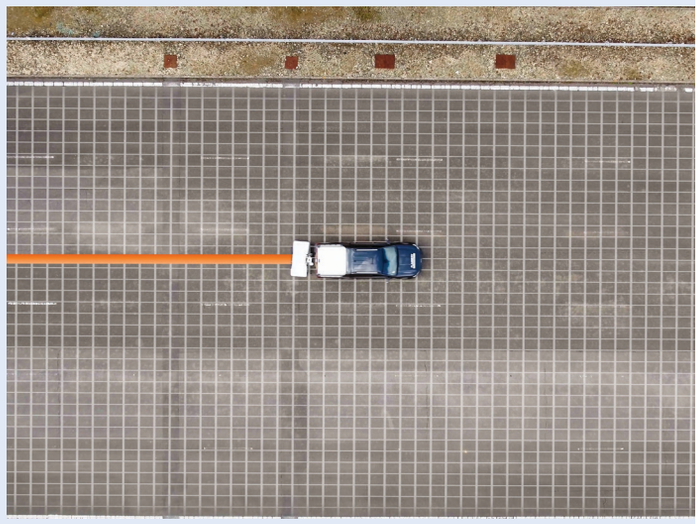
"In this user case, the operator can quickly create or use imported avoidance zones in the cabin. Once triggered, the hydraulic functions of the excavator can be slowed down or even brought to an entire stop. It is effortless for the operator, which is important to us as, often with innovations, the onus is placed on the operator. Here, you can see an effort has been made to reverse this trend.

We also can disable the excavator tracks' motion to stop any environmental or drainage trench breaches, for example.

In addition, we can include overhead obstructions such as powerlines or, as I've been recently testing, sign gantries.

It's great to have something which takes away some of the stress associated with hazards surrounding operating plant, this solution really does make a difference and will help create more efficient and streamlined experiences on site moving forward."





CONCLUSION

For years, the industry has been facing issues with avoiding hazards when using plant on site. Through using dynamic avoidance with an engineer turning up on-site and measuring everything underground and above ground that needs to be avoided, we're able to save on cost but, most importantly, ensure that people are getting home safe every day.

This system takes away the risk of human error, therefore removing the onus from the operator. Any stress of anxiety about the system stopping or tipping over is removed, letting operators and site management relax in the knowledge that all hazards have already been considered.

We look forward to engaging with all interested parties from engineers, contractors and operators to deliver the best possible service.

This technology is making a difference when working on public roads, for example by making a virtual wall that's aligned with the highway that then stops machines being able to break through that wall and into live carriageways. The 3D solution interacts with the XWatch solution over a canvas message, so when Leica pick up the avoidance zone that then sends the XWatch signals that can then slow down proportionally towards the avoidance and eventually stop the machine at the pre-determined position.

Kier Construction Director, Dave Cooper, has been witnessing first hand how the system has been making a difference on the A585 site:

Over the last few months Kier have been working alongside Flannery, Leica Geosystems and Xwatch Safety Solutions trialling the latest 3D Avoidance System. We've definitely been putting the system through its paces under different scenarios, including underground services and overhead structures. The system has been and will continue to be a great success on future projects."

Chris Matthew, Strategic Manager at Flannery Plant Hire, has been working closely with this solution as it was developed on Flannery excavators:

"This solution combines the Leica Geosystems MC1 machine control software and XWatch Safety solutions. It has been under a collaborative testing approach in the UK for some time. As a partnership between with Flannery Plant Hire, Kier and technology partners, we are very proud of the achievements and developments in our passion for modern construction methods."

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If you have any questions, please contact us by emailing:
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