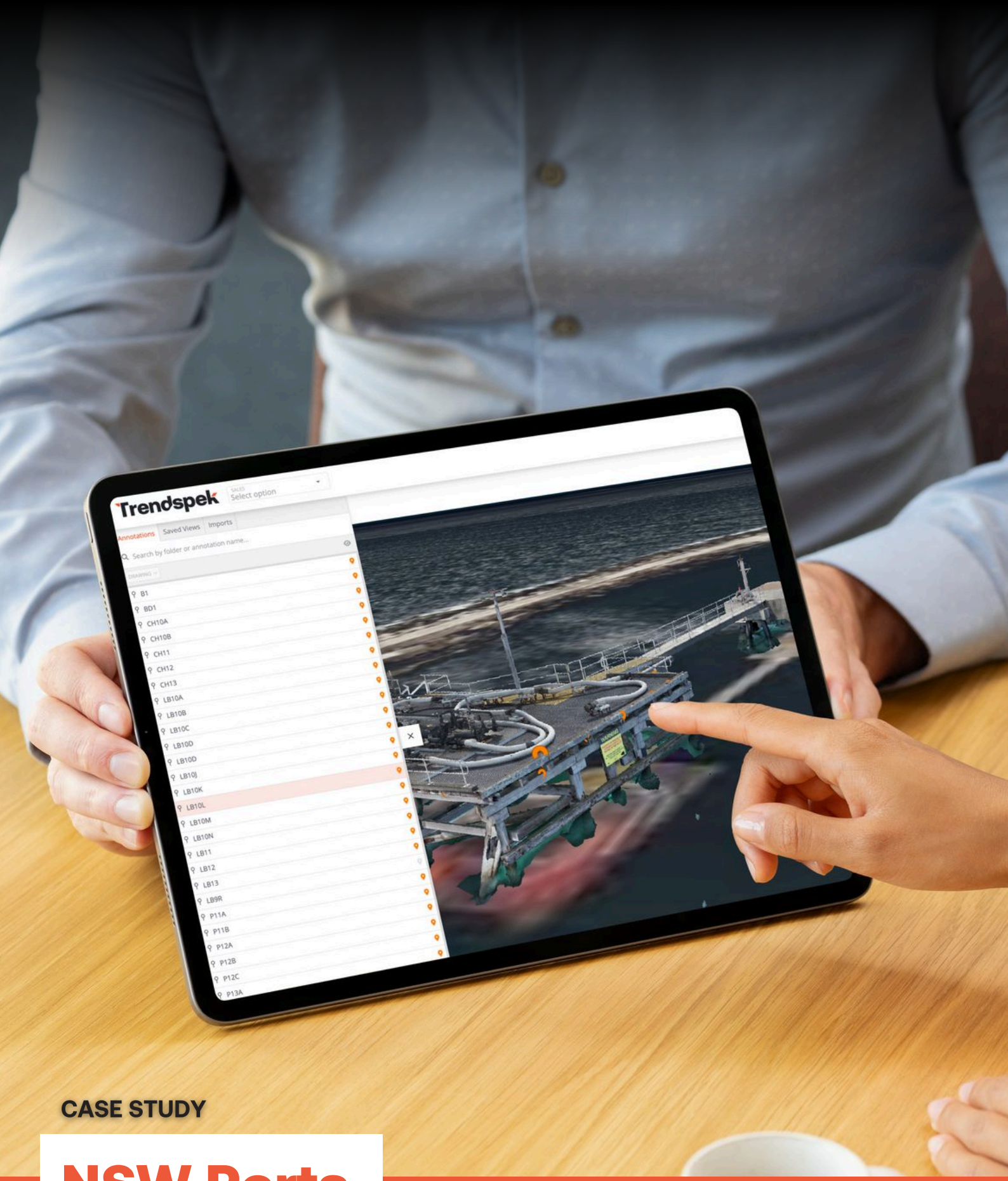
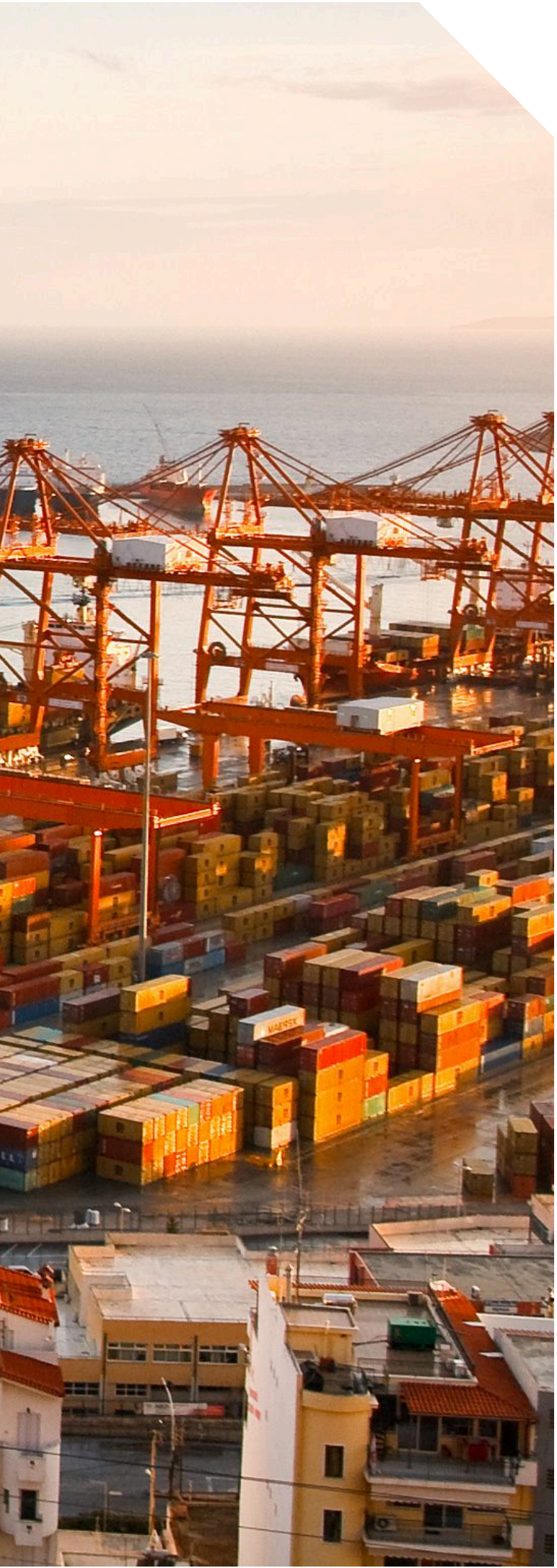



CASE STUDY

# NSW Ports

## How 3D Technology Transforms Maritime Asset Management



## Overview

**NSW Ports oversees major shipping hubs in Australia, including Port Botany and Port Kembla, the state's largest motor vehicle import terminal.**

**In June 2023, they adopted Trendspek's 3D Structural Lifecycle Management software to enhance their asset management and inspections, gaining deeper insights into the condition of their wharves, jetties, and other maritime structures.**

By using photogrammetry to create interactive 3D models of maritime assets, NSW Ports is raising the bar for operational efficiency at 24/7 shipping ports.

This approach has delivered vast cost savings and consistent asset data accessible to multiple stakeholders. From inspecting wharves to advancing environmental sustainability initiatives, Trendspek is helping NSW Ports address complex challenges and seize new opportunities.

### Stakeholders interviewed:

**Maruf Akhtar**
**Asset Systems Manager**
NSW Ports

**Ashley Rangott**
**Asset Manager**
NSW Ports

# How they got started

The maritime industry has increasingly turned to technology to inspect large, hard-to-reach port structures and meet stringent WSCAM criteria. This includes areas like the undersides of shipping wharves, traditionally inspected by boat with paper reports, often limited by tidal and weather conditions.

NSW Ports began exploring 3D modelling as a way to overcome accessibility challenges and reduce dependence on physical site visits. The journey began with a specific need: obtaining detailed views of inaccessible or hazardous areas.

After evaluating various technologies, including drone LiDAR surveys, they selected Trendspek's 3D software for its data quality, comprehensive asset visualisation, and efficiency in time and cost.

This marked a significant shift for NSW Ports, according to **Maruf Akhtar**, Asset Systems Manager at NSW Ports for two years, and **Ashley Rangott,** Asset Manager at NSW Ports for 13 years.

"We made the decision because the industry was heading towards a 3D view of assets. Many of our structures are old and challenging to access. Having a 3D model allowed us to inspect and assess these assets remotely, reducing time and effort," says Maruf.

**"With 3D models, we could better understand the complexity of our assets and even plan remediation projects more effectively,"**

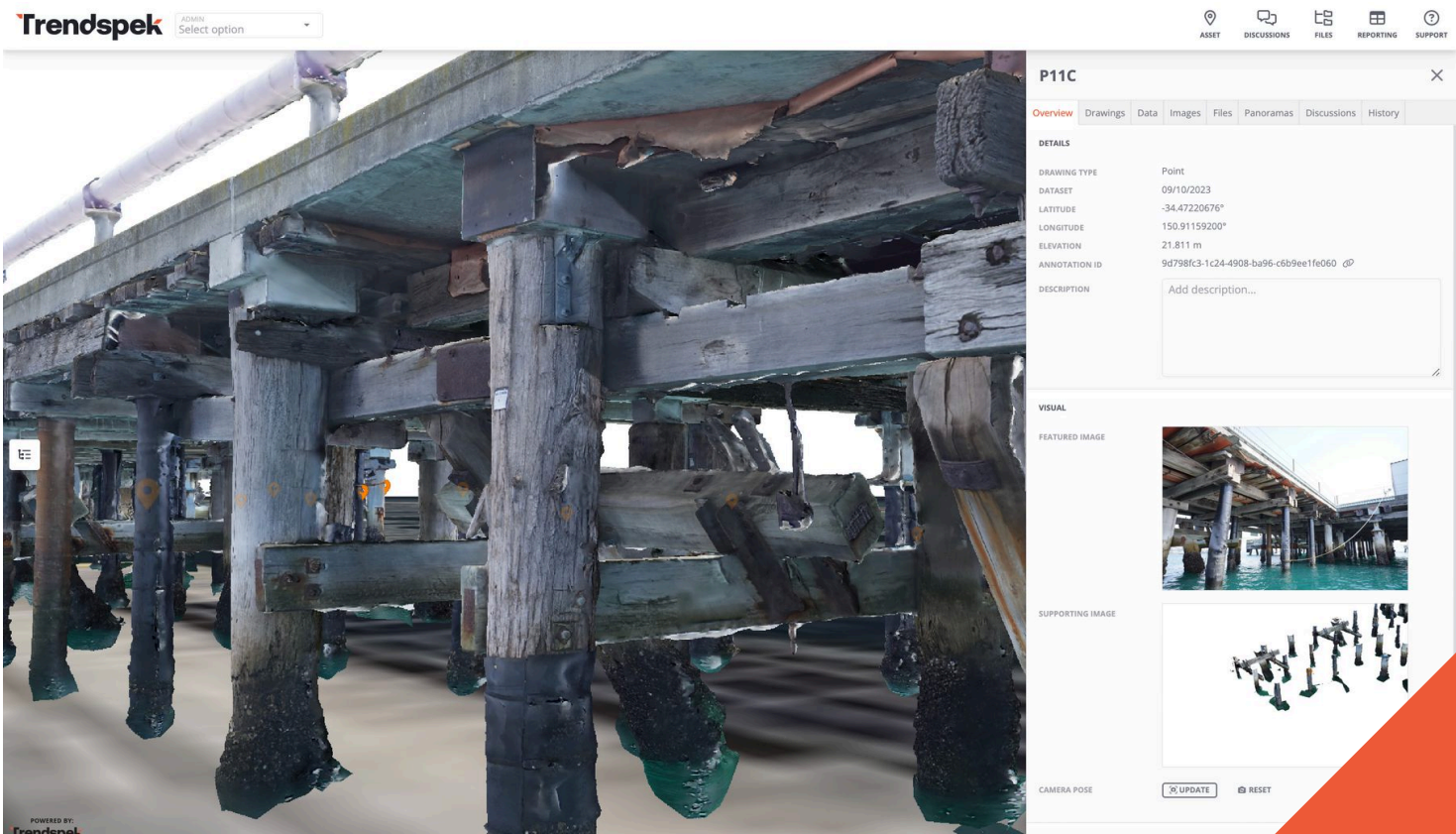
Before adopting Trendspek, NSW Ports relied purely on site investigations for condition assessments. These were often based on static 2D engineering plans or historical drawings, which could miss critical details – often requiring additional site visits to verify.

As Ashley explains, with 2D plans and on site, "you're relying on what that person is able to see which can sometimes be limited with weather, sea and access conditions."

Coordinating site visits also posed significant logistical challenges: requiring alignment of team schedules, suitable weather conditions, and site permissions. Inspecting hard-to-reach areas, such as sections of the jetty, often involved using boats or scaffolding.

"You would have to go there in a boat and plan it from a boat, and take notes on paper, which can challenging and is labour intensive," says Ashley.

**By contrast, Trendspek's 3D models provide a verifiable, detailed record that multiple stakeholders can revisit online to understand asset conditions – accessible via web browser, from the office.**

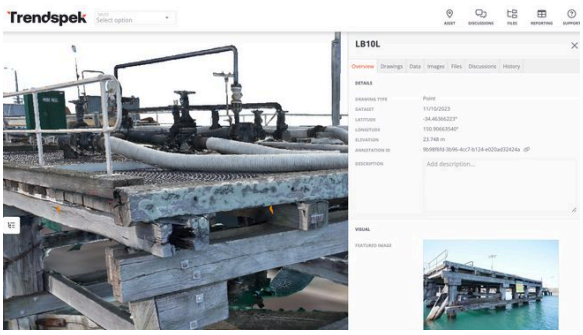


## Accessing all areas

“**That’s one of the real benefits of Trendspek – accessing those hard-to-reach areas. For example, our bulk liquid pipelines run under berths in tidal zones and formerly required boat access. Now, it’s all available in the model,”** says Maruf.

Maruf notes that 3D models also allow engineers to understand complex components, such as how different structural elements connect. This reduces the need to consult old engineering drawings, saving time and avoiding potential misinterpretations.

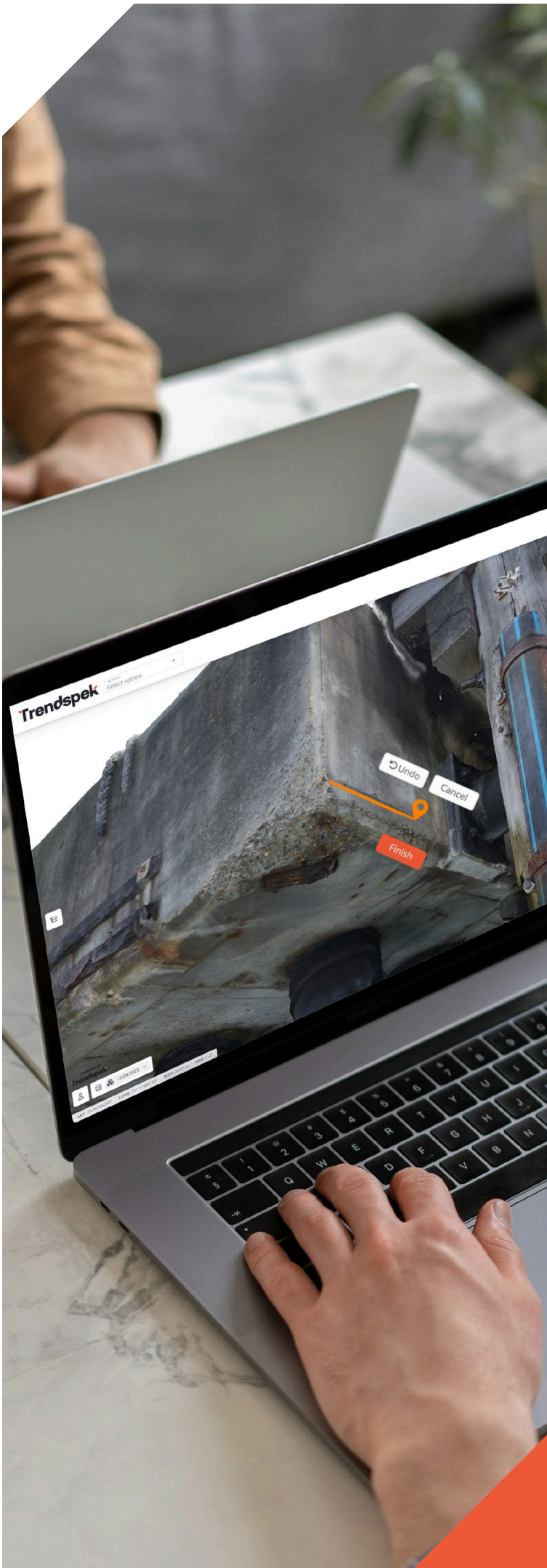
**"Being in the engineering team, we need to understand how it was constructed—how the bolts are joined, how it is supported. If we have a 3D model, it gives us the picture in front of us, showing how it was designed and how complex it is."**




These models have also streamlined project work, particularly during the tendering phase, by giving contractors an early, precise view of the asset, enabling faster and more informed decision-making.

**“It’s handy in the tender phase, and for remediation and construction projects. It can take a lot of work to organise a site inspection – when all the right people are available, the weather is suitable, it’s not too hot, it’s not too windy or raining, and shipping and operations permit access. You need all the variables to line up. Whereas now, we can give them the 3D model and they can start looking at it and getting their head around the project earlier. This saves a lot of time in the site inspections.”**

Overall, the shift from 2D to 3D has been a "a step in the right direction" for its ability to integrate diverse data sources and enhance workflows.



## Improved collaboration

Managing maritime assets demands 100% detailed digital records to provide engineers with actionable insights for maintaining and repairing complex structures, even in the most challenging environments.

By including Trendspek into their tech stack, alongside GIS software and field data tools, NSW Ports has been able to successfully streamline their inspections while achieving significant time and cost savings.

"**There's significant efficiency in capturing data and conducting assessments. Much of the work can now be done in the office rather than on-site. This consistency also means we're no longer relying solely on subjective observations taken on site — the observations are verifiable in the model**," says Ashley.

Collaboration has also significantly improved, with contractors, stakeholders and executives all able to remotely access models to plan maintenance activities with full context.

"Sharing these models with contractors has been a game-changer. It provides a snapshot in time, allowing contractors to familiarise themselves with assets before arriving on-site, saving time during tendering and preparation," says Maruf.

"The models are also useful for training contractors. Once they understand how to use the system, they can conduct much of the initial assessment remotely. We even receive positive feedback like, 'Wow, this is exactly what we needed'".

**"By sharing these models with external contractors, we've cut down on labour costs and increased efficiency. For instance, with Trendspek, we can significantly cut down on costs for a full jetty inspection."**

For hard-to-access or restricted areas, Trendspek's 3D models have proven invaluable. "We can now use the models to identify areas needing attention, without the logistical challenges of physical access," Maruf explains.

## Key outcomes of a digital approach

### Faster Inspections
3D models reduce inspection timelines from months to weeks, and provide contractors with important context ahead of time.

### Enhanced Collaboration
Sharing 3D models with contractors improves project planning and reduce ambiguity, particularly in complex upgrades like fire systems.

### Cost Savings
Certain types of inspections are now only a third of the usual cost, saving thousands per project.

### Comprehensive Data
Trendspek provides consistent, verifiable records, eliminating subjectivity and enabling repeat inspections to track changes.

### Improved Efficiency
Remote inspections eliminate logistic challenges such as restricted or hard-to-reach access, weather delays, and team availability issues.

Learn more

Ashley adds, **“We recently used the 3D models to plan a fire system upgrade. The contractor, based in Queensland, was able to review the site remotely, reducing on-site time significantly —a crucial advantage given the limited number of specialists in Australia.”**

Beyond its initial purpose, Trendspek has also unlocked unexpected benefits, including applications for a sea wall sustainability initiative.

“One unexpected use case was for our sustainability team. They’re planning a living sea wall to support marine habitats, using 3D models to assess potential locations without needing to conduct difficult site visits,” says Ashley.

Ashley explains that this solution was particularly beneficial for a team that operates from the office, as it gave them a clear visualisation of what they were working with.

"Before, they may not have had a clear understanding of the physical space and its features," he adds.

With Trendspek’s detailed, interactive models, the team could easily evaluate factors like proximity to sensitive marine ecosystems, ease of construction, and other environmental considerations.

Despite the benefits, NSW Ports have also encountered challenges.

Maruf says: “In the beginning, we lacked expertise in deciding the right capture specifications. We’ve since learned the importance of having a standardised approach for different asset types.

One recent application was recording the uptick in condition of an emergency jetty after a remediation project was completed.

**“We used Trendspek to re-capture our Emergency Jetty post-remediation. Comparing captures side-by-side gave us clear insights into improvements and ensured the quality of repairs. It was also highly cost-effective.”**

## What Comes Next

Looking to the future, NSW Ports has ambitious plans to integrate Trendspek into broader workflows and projects.

**“We’re looking into integrating Trendspek with other systems to streamline workflows and reduce the number of platforms we use. The goal is to consolidate all systems into a more cohesive environment.”**

**“We’re also keen to expand into new areas, like integrating BIM models with Trendspek and exploring ways to merge above-water and underwater captures. The potential is huge”.**

NSW Ports aims to expand the use of Trendspek’s platform to:

- **Standardise Capture Specifications:** Define consistent standards for data quality and capture processes across assets.
- **Broaden Integration:** Incorporate Trendspek with other enterprise systems to streamline workflows and minimise technology stacks.
- **Enhance Training**: Equip internal teams and contractors with deeper platform knowledge through regular training sessions.
- **Innovative Inspections:** Trial emerging technologies for underwater and intrusive testing, combining Trendspek models with advanced ROV capabilities.

With Trendspek, NSW Ports is set to lead the industry in adopting smart, sustainable, and efficient asset management practices.

**“We weren’t doing this five years ago, but it has since changed things significantly. This technology is helping us work smarter, and it’s to the benefit of our company and the broader industry.”**

## Software Capabilities

### High-Fidelity 3D Models
Trendspek’s 3D Precision Reality Twins deliver new levels of clarity for large-scale maritime assets, enabling detailed asset analysis and planning with millimetre precision.

### Accessibility and Safety
Difficult-to-reach areas, such as underneath wharves and jetties, were captured via integrated reality capture, minimising on-site risks.

### Collaboration and Training
NSW Ports used Trendspek’s models to train contractors and engage stakeholders, ensuring everyone had a clear understanding of project requirements.

### Integration with BIM and GIS
The platform integrates seamlessly with Building Information Modelling (BIM) data and Geographic Information Systems (GIS), offering holistic asset insights.

### Time-Lapse Capabilities
Repeated captures allow for side-by-side comparisons, tracking changes over time for better decision-making.


Learn more

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