



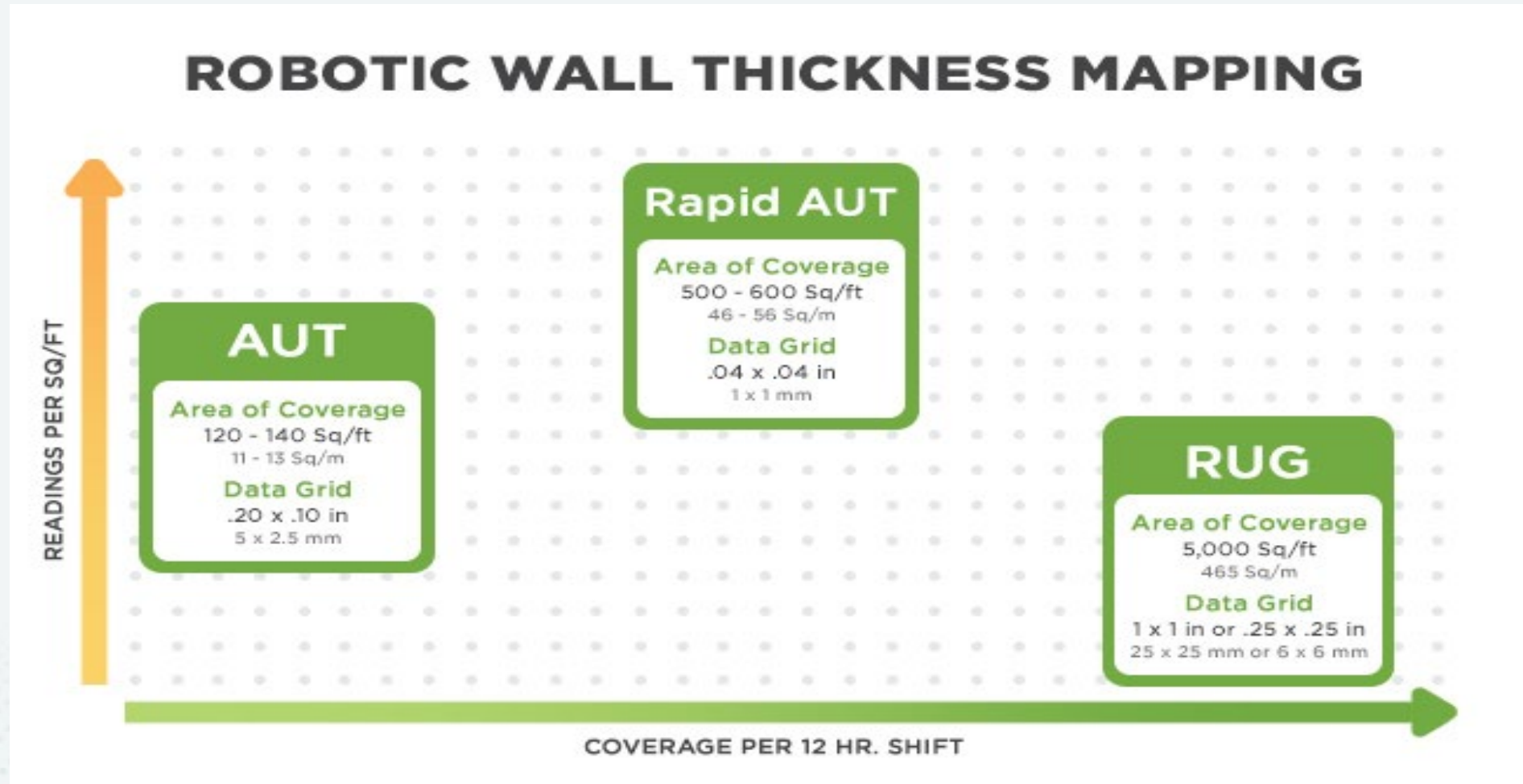
Automated Solutions for Industrial Inspections

Robotics and Software for the Future of Inspections

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Tools for Wall-Loss Damage Mechanisms

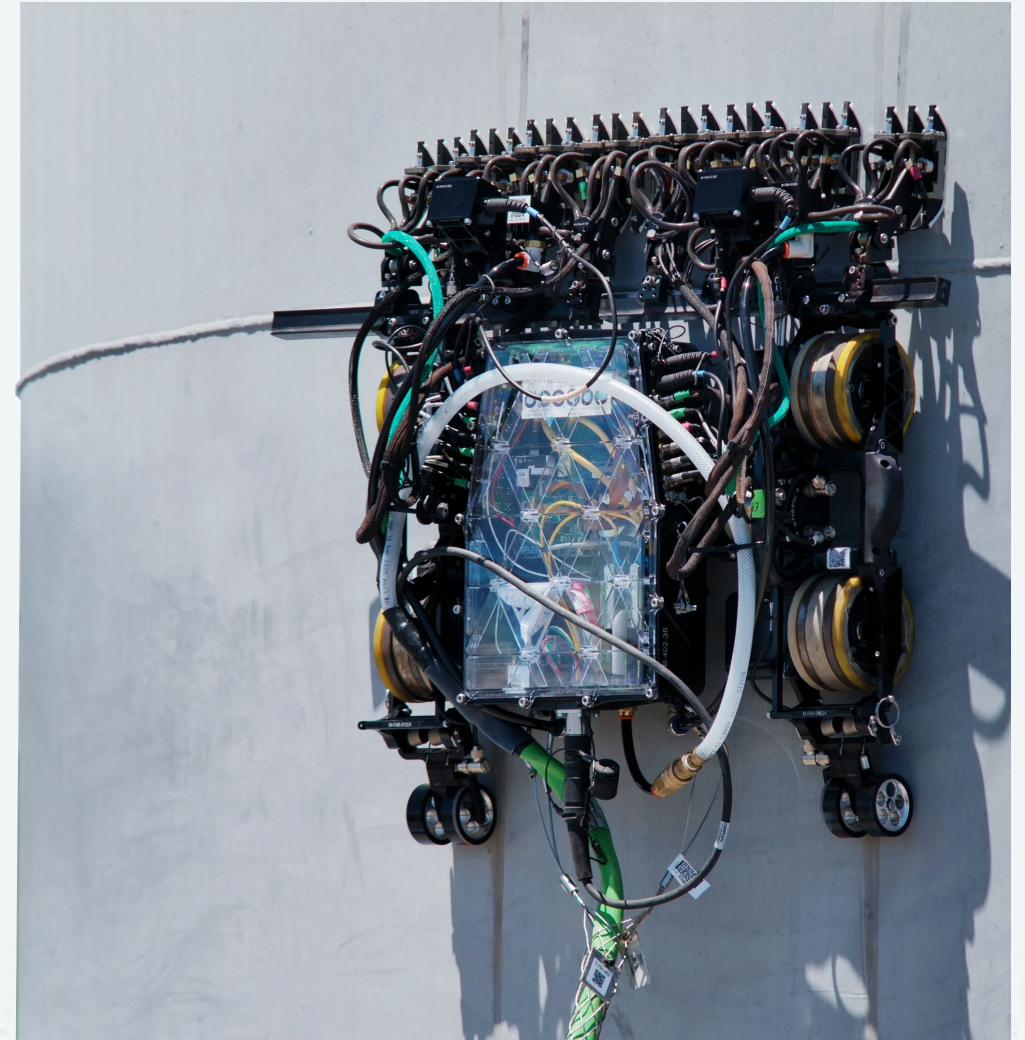


Rapid Ultrasonic Gridding

TOKA platforms can quickly and easily collect thousands of UT thickness readings per square meter, as well as photos, across large areas.

Excellent **climbing ability, maneuverability** and **heat tolerance** allow for simple deployment on in-service assets, reducing the need for scaffolding and time on site.

Assets such as **pipings, pressure equipment, above-ground storage tanks, boilers, vessels, and drums** are all good applications for this technology

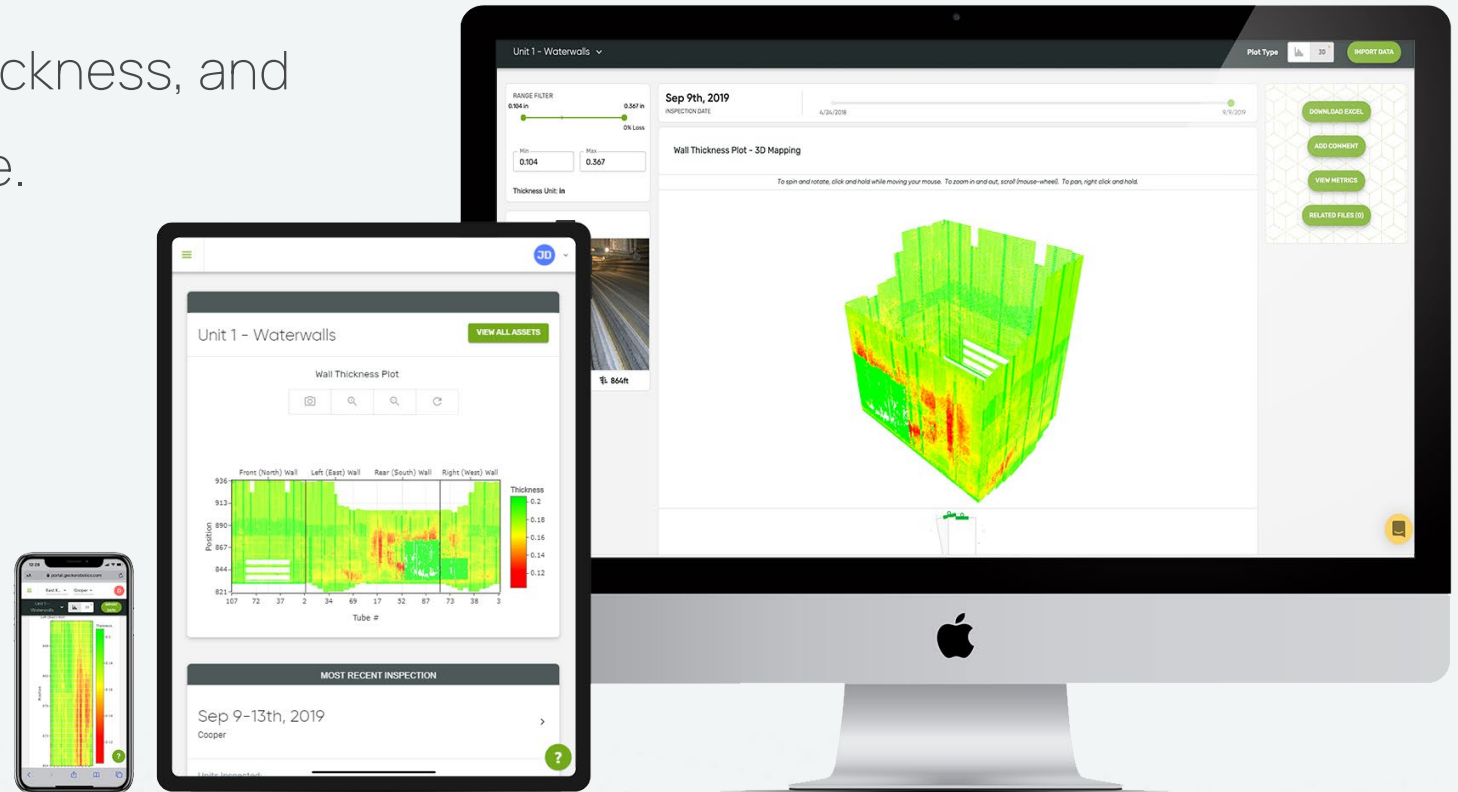


Data Driven Decisions

Portal integrates photos, metal thickness, and coordinates into one intuitive page.

Cloud functionality creates a single source for asset data.

Choose from a growing list of data tools.



Tank Roof Case Study

Goal

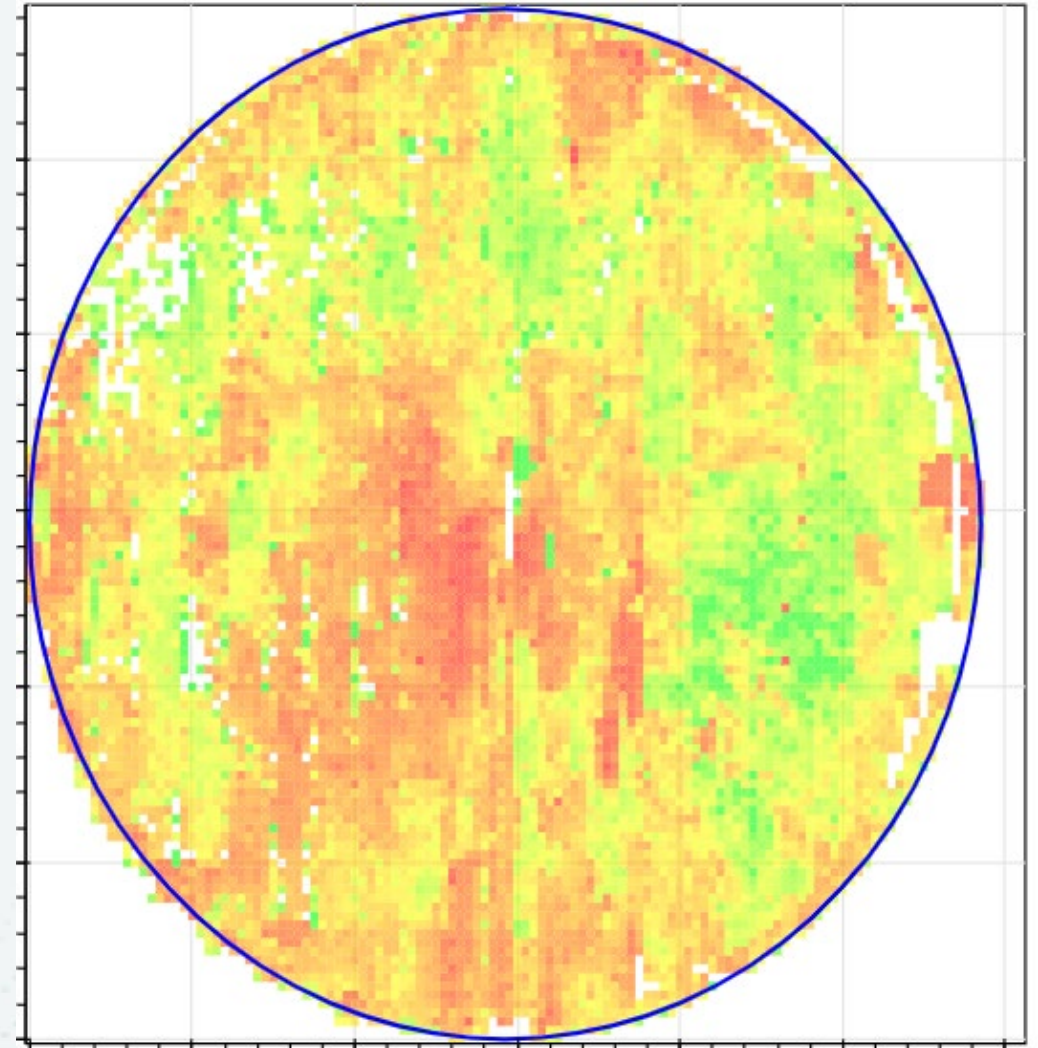
Ultrasonic inspection of 36m diameter fixed roof

Traditional Approach

- Manual ultrasonic sampling with inspectors on roof

Gecko Solution

- 2 technicians, 1 robots, 2 days
- 900,000 data points with no roof access
- Several areas requiring immediate repair detected



Tank Shell Case Study

Goal

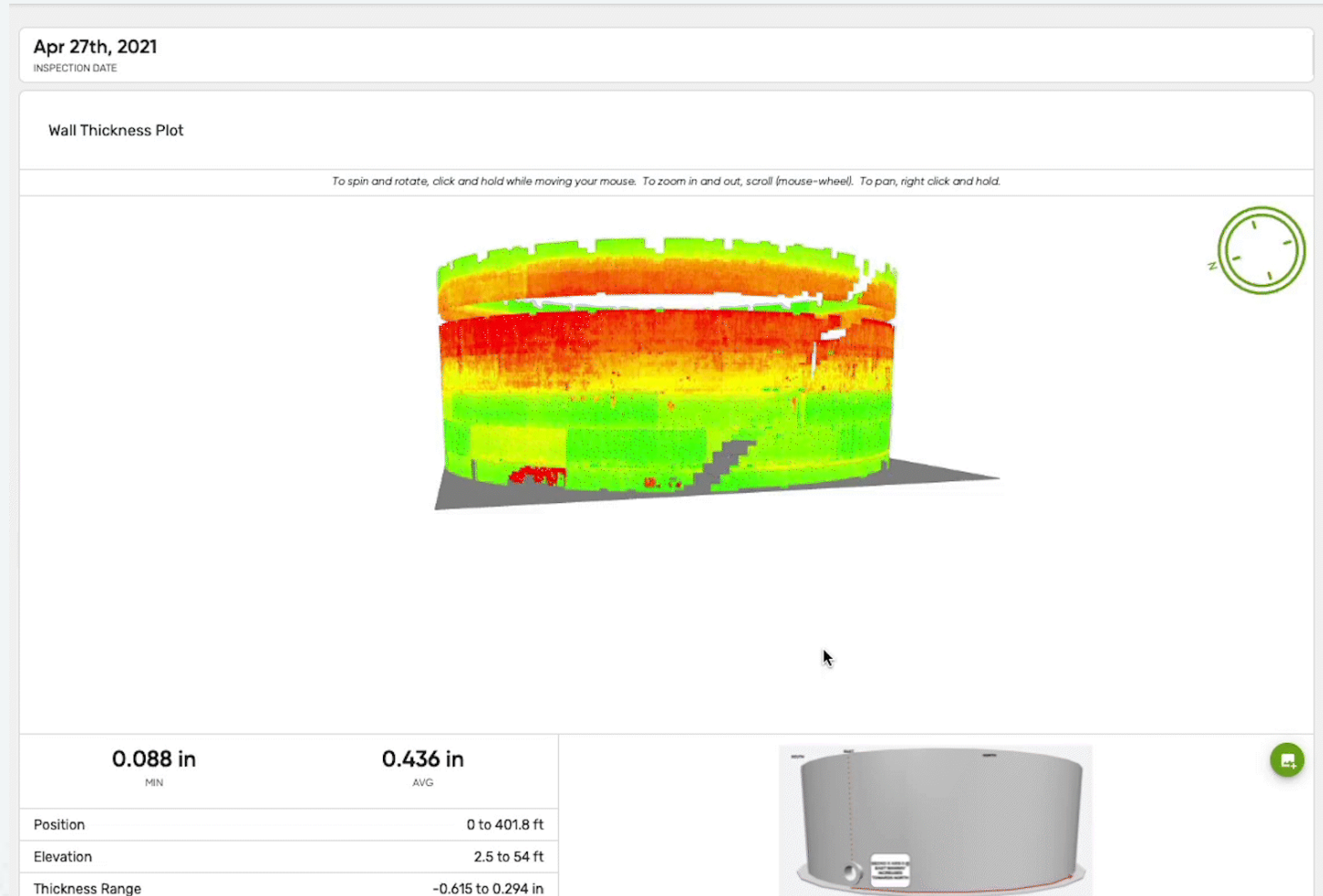
External tank shell inspection to evaluate damage at the fill line (120m diameter x 17m height)

Traditional Approach

- Sampling from pole crawler or advanced crawler
- Sampling with AUT and ropes
- Full coverage with traditional methods is time and cost prohibitive

Gecko Solution

- 2 technicians, 1 robot, 2 days
- 25+ million data points
- Deployed from ground level
- Identified extensive fill line damage and unknown midwall defects in 1st course



Piping Case Study (Flare Line)

Goal

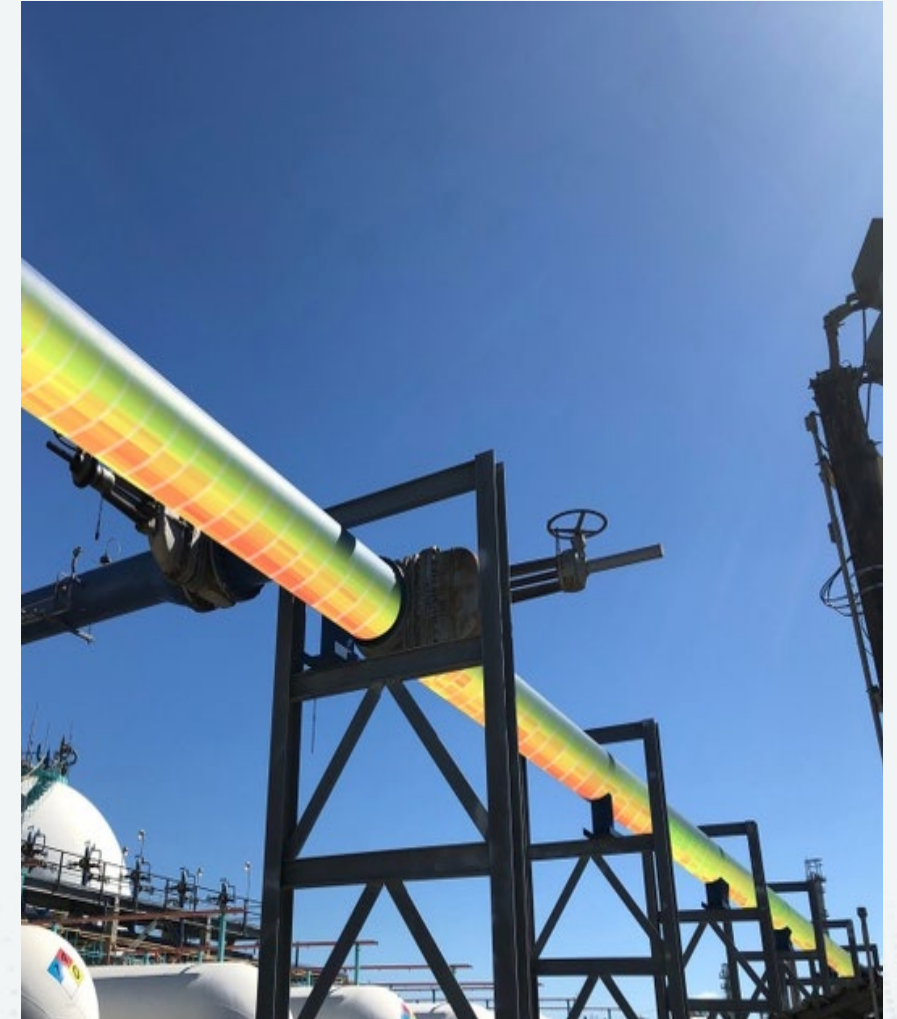
Inspect ~330 meters of 600 mm elevated flare line.
Scan the bottom half of pipe across multiple fire lanes and units (300 m²).

Traditional Approach

- AUT inspection for 30 shifts
- Scaffolding required for access

Gecko Solution

- 3 Technicians, 1 robot, 6 days
- Robot deployed from JLG – no scaffolding necessary
- 8 million data points

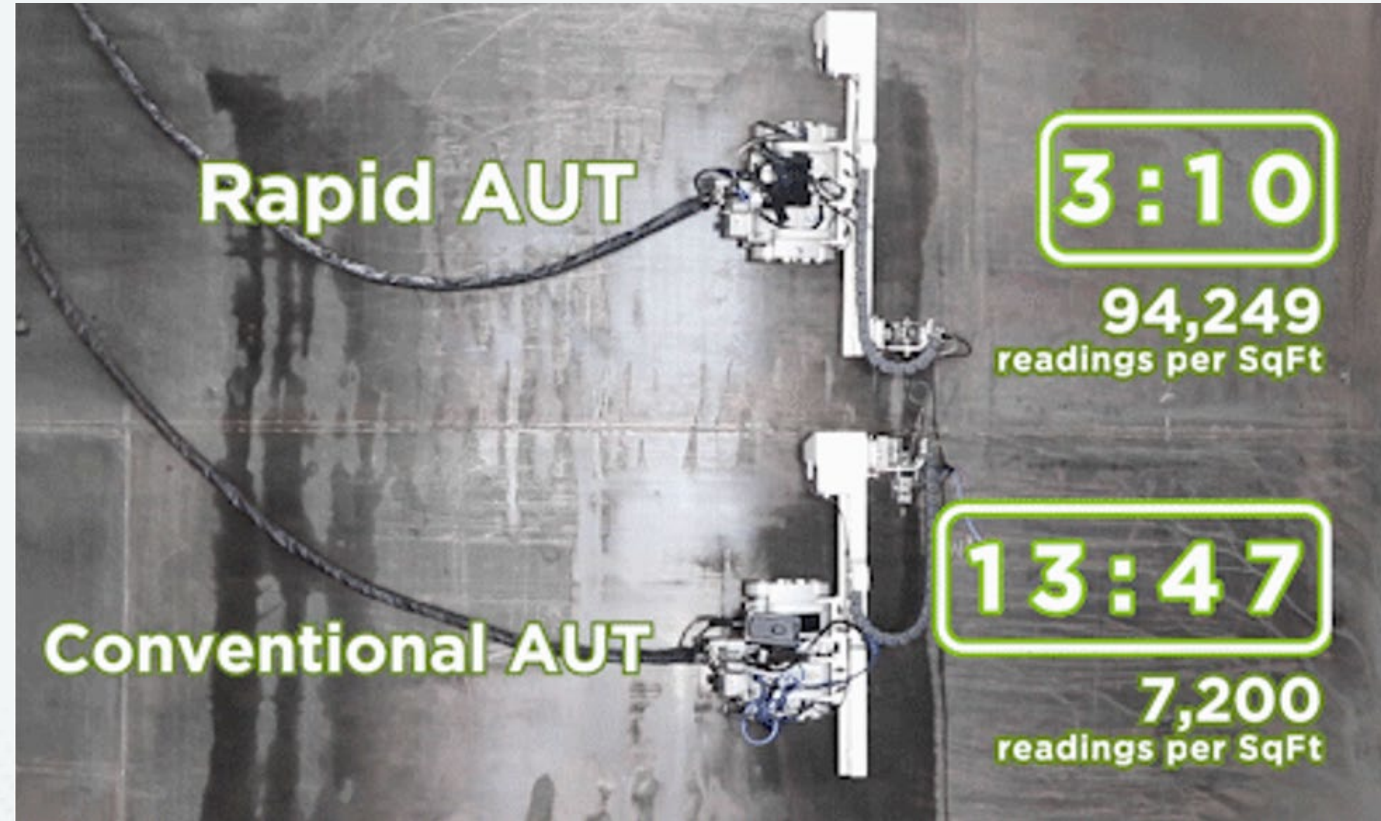


Rapid AUT

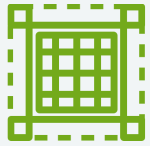
Rapid AUT utilizes phased array technology to do the types of corrosion mapping associated with traditional AUT.

With a scan speed that is **3-5x faster than AUT**, Rapid-AUT can complete large jobs in far less time and with **10-12x the data density**.

Use as a direct replacement when AUT is specified for the work. Especially useful for large and difficult to access projects.



Rapid AUT for Wall Loss



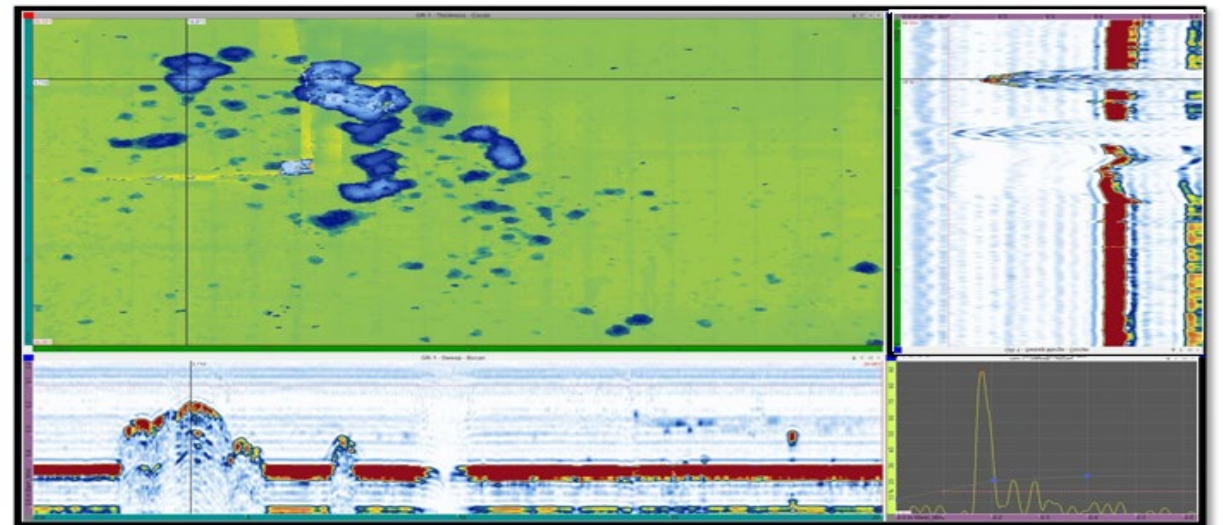
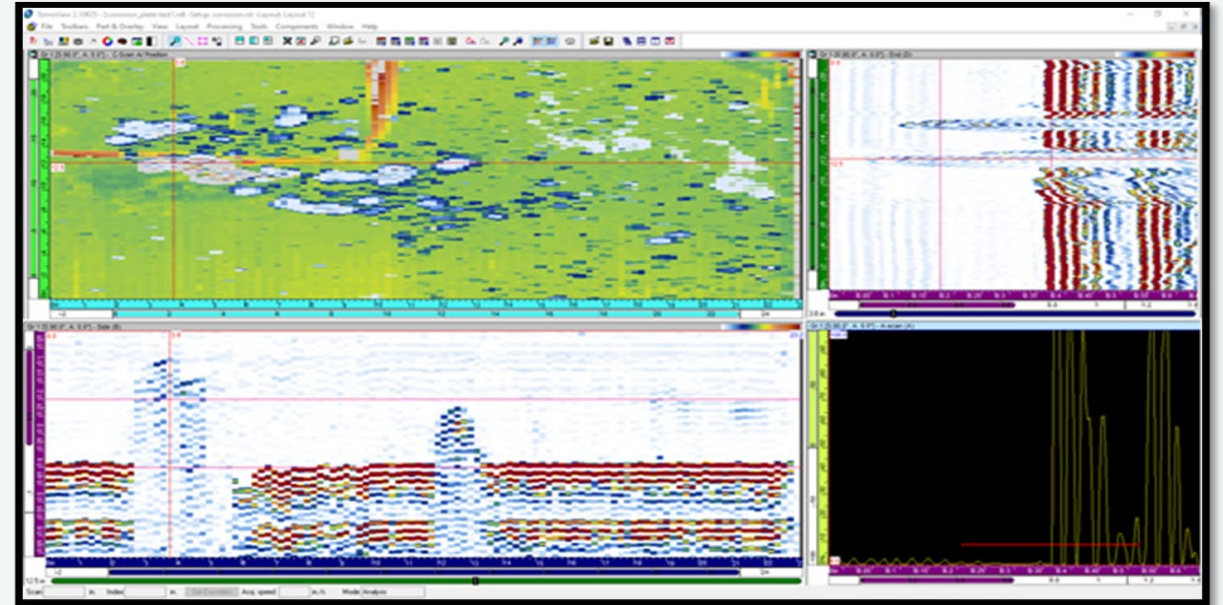
High data density reduces re-work and miscategorized calls.



Accurate robotic positioning allows reproducibility and repeatability.



Digital data delivery allows for the transfer of huge files.



Robotic Weld Inspection

Time of Flight Diffraction (TOFD) and Phased Array (PAUT) are two common tools that can be remotely deployed for the detection of discontinuities.

Remotely scan for discontinuities such as **cracks, corrosion, and flaws** with a high level of production and detection. Gecko can scan up to 100 linear meters of weld per shift, digitally capturing 100% of data on assets up to 20cm thick.

These technologies, deployed individually or together, can make a great alternative to dye penetrant or mag particle testing on assets such as pressure vessels or process equipment.



Wall Loss Case Study – Rapid AUT

Goal

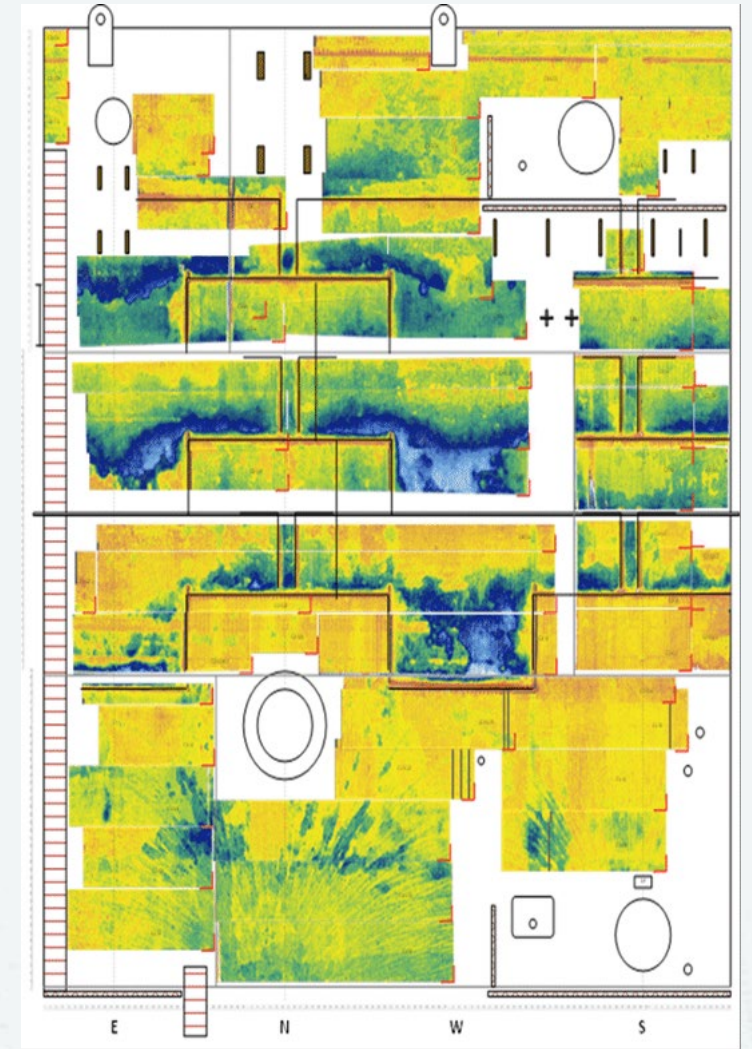
External inspection to set the next interval, over 80 square meters of area

Traditional Approach

- Tri-element internal inspection with scaffolding
- Conduct manual UT and particle testing to check thickness and internal cracking
 - Over 8 shifts of work
 - + Scaffolding time and expense

Gecko Solution

- 2 inspectors, 1 robot, 4 days
- No scaffolding time or expense

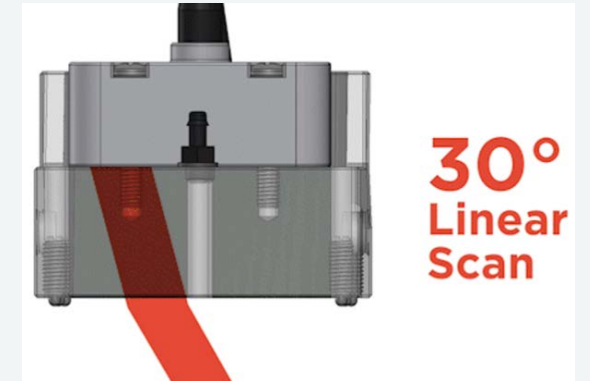


Tri-Lateral Phased Array for Wet H₂S Damage

This “Patent Pending” **2-probe Phased Array system** is mounted on an automated & steerable crawler for ultra high-density remote deployments.

TriLat has **5x field production** and **10x the data density** of conventional tri-element systems.

Tri-Lateral was built to reduce the time and improve the **detectability** for HIC/SOHIC inspections in **wet H₂S** and **caustic applications**.



Hydrogen Damage Case Study

Goal

External in-lieu of internal inspection of butane sphere for the next interval. Inspect over 270 square meters of area that is inaccessible by JLG.

Traditional Approach

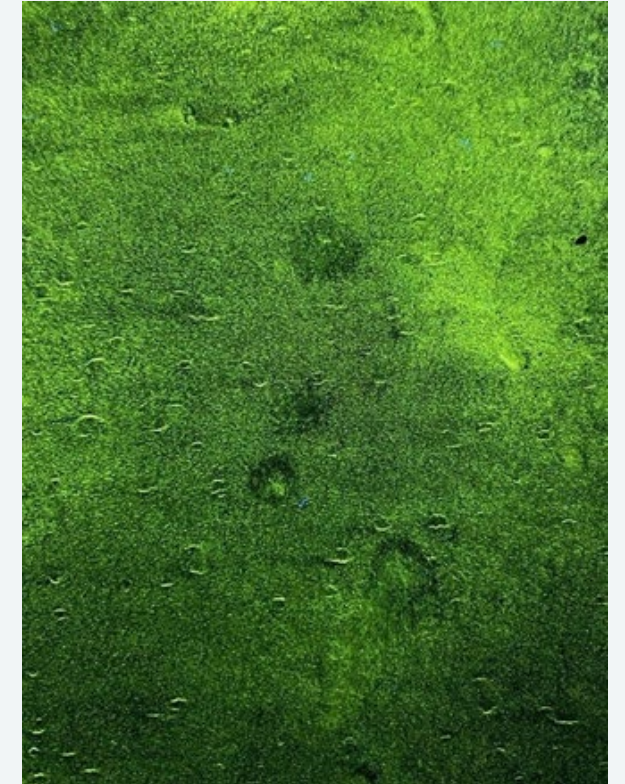
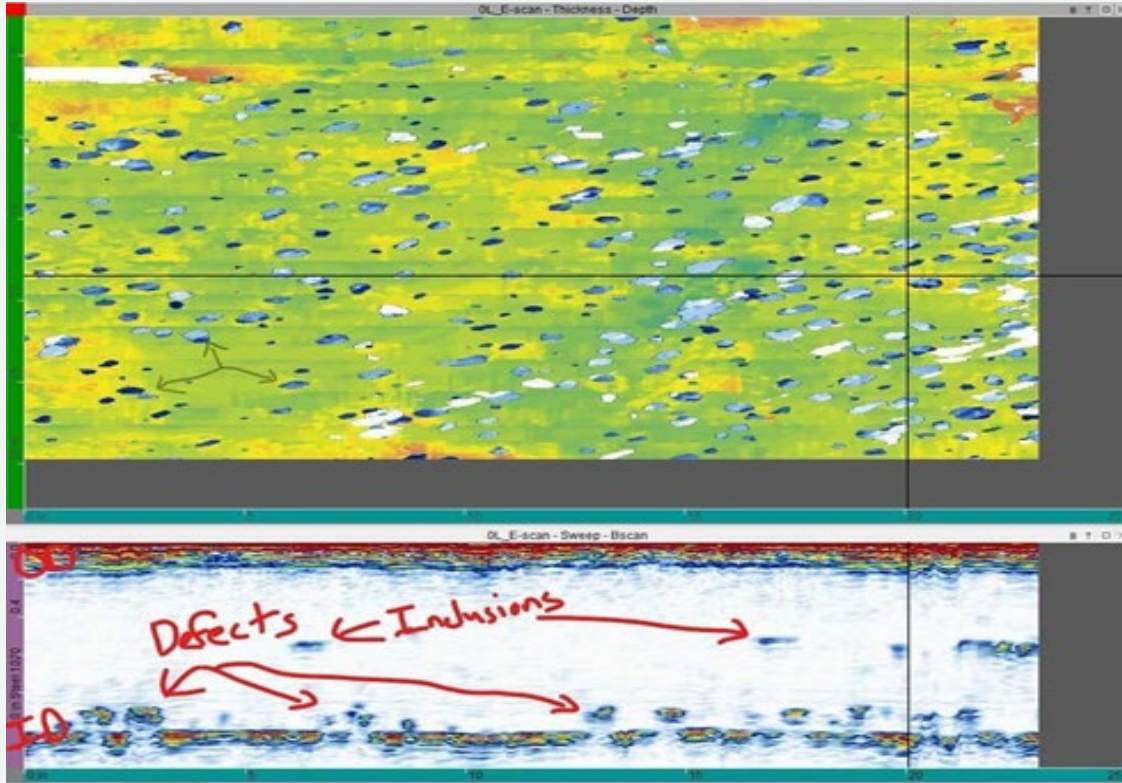
- AUT internal inspection considered cost prohibitive because of scaffolding the interior
- Conduct manual UT and particle testing to check thickness and internal cracking
 - Anticipated to require over 30 shifts
 - Internal scaffolding time/cost not provided

Gecko Solution

- Rapid AUT shell scan and PAUT weld scan
- Actual time on job was 6 shifts and costs ~50%
- No scaffolding or vessel entry



External Vs. Internal Results



Blisters found approximately 18mm deep with periphery cracking towards the ID.
Mid-wall blisters discovered but no periphery cracking confirmed.

Non-Intrusive Inspection Case Study

Goal

Perform inspections on 140+ vessels – Inspecting for wall loss, cracking, and hydrogen damage.

Traditional Approach

- Remove tanks from service, empty, and clean
- Confined space entry to prep and inspect
- Scaffolding required in many cases.
- Work anticipated to take most of 2021

Gecko Solution

- 3 methodologies deployed by robot on the external
- No confined space, scaffolding, or opportunity cost
- Work completed in 68 Shifts, at a price ~70% cheaper than competitors
- Time and cost savings were so substantial that the client created new RBI tables and procedures, to take advantage of NII on future projects



Onwards



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