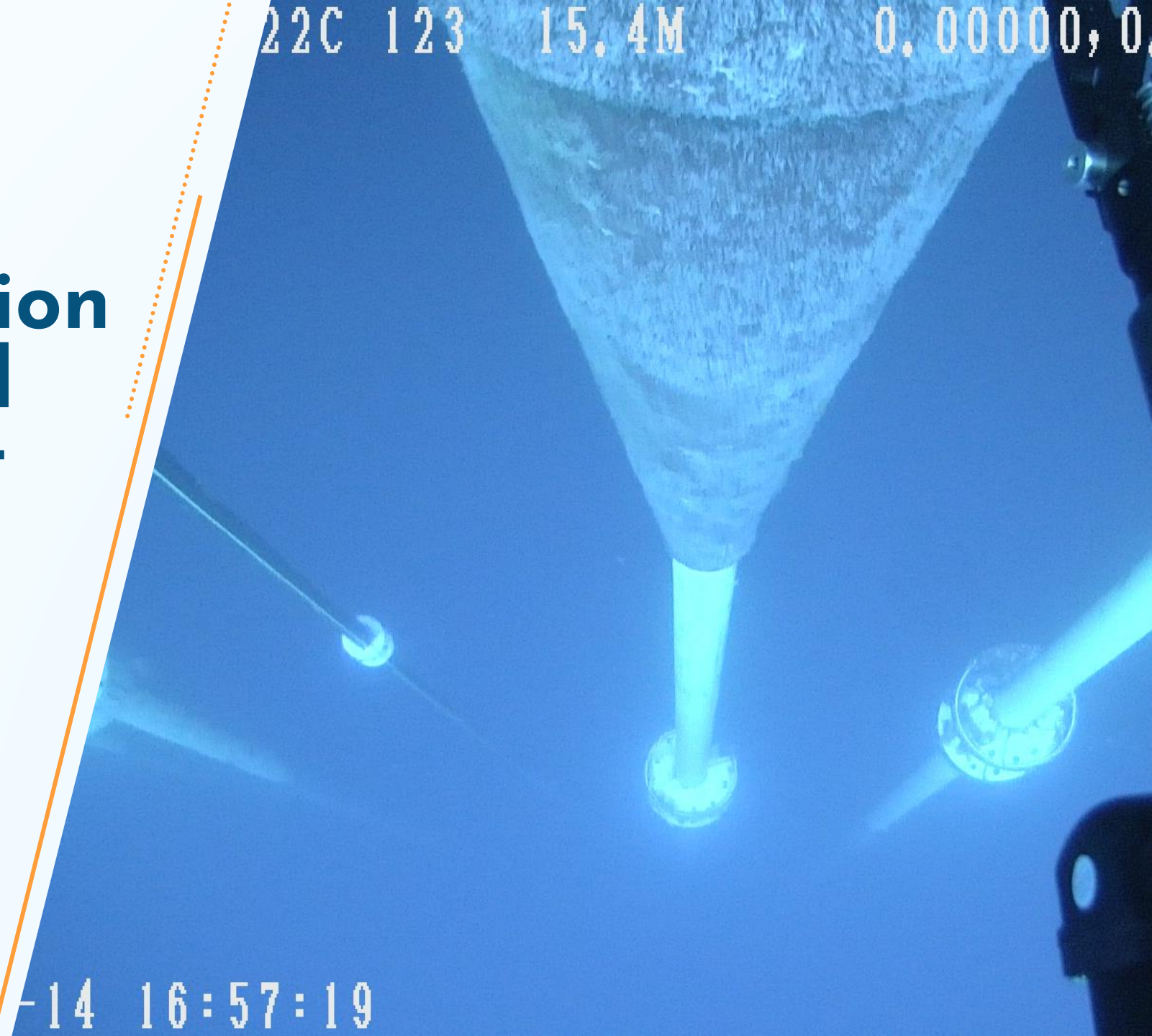




Remote Inspection Solutions and Development

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PORTFOLIO



About us



Orion Inspection Services and Consultancy is a Brazilian based company focused on developing solutions for the remote inspection market of pipelines and challenging structures, having as a differential the know-how for a necessary customization to meet the unique demands of each client: our focus is on projects that run away from the common aspect. To this end, we have partnerships with innovative companies and market leaders in their segments, besides being installed inside of one of the major universities and one of the innovation cradles of south America, [Coppe/UFRJ](#).

Formed by a technical staff with extensive experience in the engineering, inspection and data analysis fields, our team has specialized professionals in project design, execution and data evaluation.

In its portfolio, solutions are presented through services and products that cover several areas, such as petrochemicals, [oil and gas](#), [mining](#), [hydropower](#), [renewables](#), [nuclear](#), [maritime](#) and [sanitation](#).



Markets where we operate.

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Renewables



Mining



Oil and Gas



Hydropower



Nuclear



Maritime



Defense



Sanitation



Our Customers (*South America focused*)

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Saipem



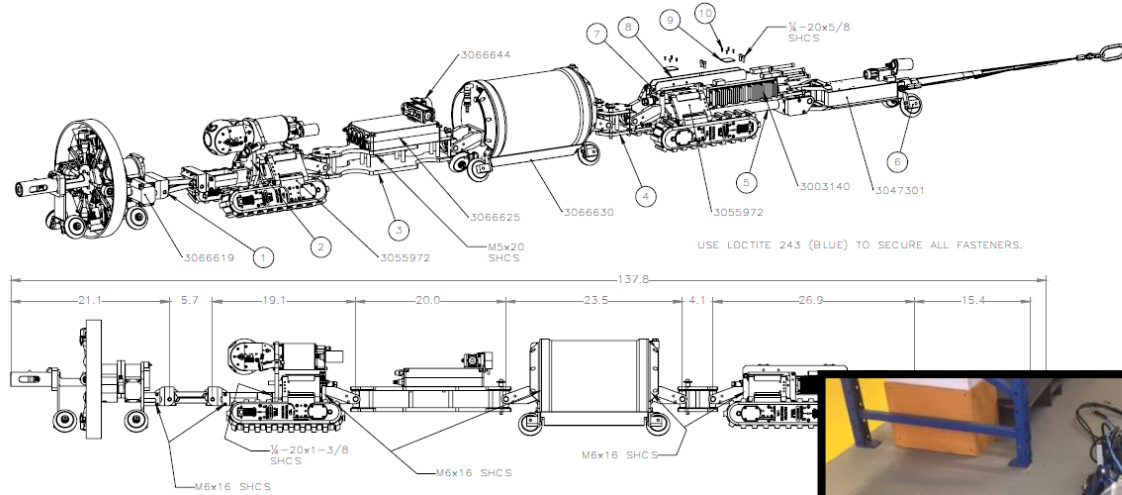
MARINHA
DO BRASIL



subsea 7

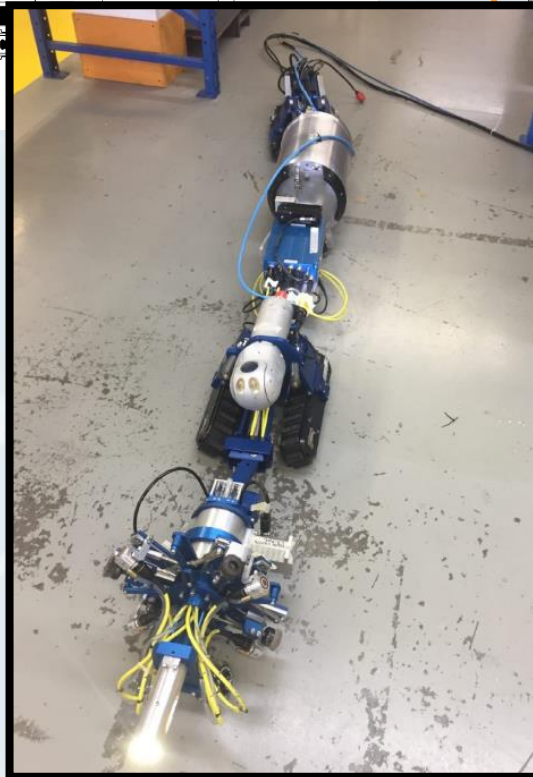


Development - RVI/NDT - Robotic Solutions



Orion Credentials in R&D:

- Winner of Petrobras CSPI - refineries and ship hull NDT crawler (*in execution*)
- Finalist of Equinor's Bridge - Automatic Hip tank's cleaning robot (*waiting for results*)
- Finalist of Nexa's - remote Solution for Pipeline mining Pipeline Inspections (*waiting for results*)
- Refit - Long ranged - 2k+ Crawler for subsea Pipeline Inspection (*concluded*)



- Remotely Operated Camera and Lighting
- Battery Powered
- Any diameter Between Ø6 & Ø100"
- Up to 1000m Tether
- Possible Sensors: Lidar, Laser, US and Others
- Evaluation of Welds, Coatings, Valves and Internal Corrosion Aspects
- 100% Waterproof



INGU



Pipers®

Inspection Solution for Unpiggable Pipelines

- Any Diameter up to Ø3" - Ø2.5" sphere
- Quick Mobilization for Emergencies
- All fluids and gas (through a cleaning pig)
- Leak Monitoring (as small as 150mL/min)
- Inspections With Zero Downtime
- Magnetic Surveys through MMM method.
- Air pockets monitoring
- Deposit Localization
- Hot Tap Monitoring
- Features detected with a meter precision.

Visit our
Website



Accelerometer



Acoustic



Magnetometer



Pressure



RVI - Robotic Solutions

- Remotely Operated Camera and Lighting
- Easy mobilization - 2 cases
- Up to 4 Hours: Fully Battery Powered
- Any diameter Between Ø6 & Ø100"
- Up to 300m Tether
- Distance Counter
- Possible Sensors: Lidar, Laser, US
- Magnetic versions for Tanks and ferro-magnetic structures
- Evaluation of Welds, Coatings, Valves and Internal Corrosion Aspects
- Possibility of adding sensors
- 100% Waterproof



Specialist Robots

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- Camera and lighting control - fully remote
- Battery operated - up to 5 hours of inspection - external power options
- Full HD and 4k cameras with Pan and Zoom (elevated options)
- Up to 150m of umbilical
- **Totally waterproof**
- Precise Distance counter
- **Magnetic Versions: Adhesion to plating and structures with up to 1" of debris, painting and barnacles**
- Versions with suction cup for cleaning (VAC)
- **Ultrasound measurement, with direct Cygnus integration**
- Various sonar options
- Hydroblasting options
- **Various Sensors: Lidar, Laser, US - others can be developed/implemented**



ROV's

- Remotely Operated Camera and Lighting
- Inspection of dams, lakes, rivers, reservoirs, open seas
- Advanced Stabilization
- High-Definition video and photos
- Versatile: applicable from aquaculture to the Oil & Gas industry
- Cost and Safety- cost-effective and safe alternative for inspections in hazardous environments
- Easy mobilization: 1 and/or 2 cases
- Up to 4-Hours: battery powered
- Several add-ons available. Customization by Orion.
- Real-time Data
- Up to 400m Tether



Zenith

- **Fully Automated Visual Inspections**
- Place Zenith inside the asset, press go, and minutes later receive 100% asset coverage with no human interaction
- **4K Camera, with 30x optical zoom**
- **Wireless operation with up to 150m of drop camera range, rotates 360° panning & 180° tilt (photo/video/zoom)**
- Simple Winch Controls
 - Speed - Low to High
 - Live depth indication
 - Set upper & lower auto thresholds
- **Battery - 1.5hrs of continuous use: 2 swappable batteries included and 2 battery charges**



4200mAh Battery /
1hr 15 min Charge Time



Keep your workforce
out of harm's way

30x
4K 18MP

High Definition
Camera



Photo Measurement
Software



10

Visit our
Website



Zenith

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- HD Large Viewing Screen built into top half of controller
- Pair a second video receiver to TV, tablet, or projector
- 30x Optical Zoom - Full frame images of the smallest defects in real-time
- 4K Video Recording - Capture a full asset with the highest resolution video
- 18MP Still Photos - Capture still photos with the push of a button
- Adjustable 10K Lumen of Led Lighting
- Photo Measurement Software - Find defects, measure their size and track their growth



Photogrammetry

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Make reliable measurements by the use of 4K photogrammetry

After the inspection is over, put all the high-resolution photos taken by Zenith on the measurement software (exclusive software included), and then we have the ability to take very accurate quantitative measurements out of these pictures.

With these high-precision measurements, you can track the rate of defect growth over time by comparing the same photo obtained in subsequent Zenith's inspections (can be 6 months, annually or even more).



OMS - Metrology

- Laser measurement, accurate to 50 microns (0.05mm)
- Tie-in weld Measurements using Long ranged crawlers (up to 1000m)
- Use on offshore wind farms connections (base, floating unit and wings)
- Weld inspection (visual and dimensional)
- Increased productivity of the welding process
- Drastic decrease in the number of repairs: Selection of "Golden Pipes" for critical sections
- *Pipe Fit-up*
- Excellence in post-manufacturing quality control
- NDT - *bending, reeling, spooling & crush trials*
- Extensive track record: Being part on projects such as Rota2, NFX, Mero I & V, Buzios V, Sepia, Guara Lula, Mecor, Bacalhau, Ormen Lange, CRPO-84
- Major clients such as Shell, Petrobras, Saudi Aramco, ADNOC, Equinor, BP



NDT Equipment

- Supply of various NDT (Non-Destructive Testing) e RVI (Remote Visual Inspection) equipment
- No need to purchase underutilized equipment: Rent, lease or buy
- State of the art technology, such as Elios 3 - Industrial Inspection Drone, Zenith - Fully Automated Inspections, the versatile AMIGO 2 and the worldwide used Olympus 45MG ultrasonic thickness gauge.
- Works for all industries
- Several technologies: Phased Array, ACFM, Visual, Thermography, Robotic Systems.





Consultancy

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**Integrity Programs,
Data Integration
and Analysis**

Beginning (M)	End (M)	Description (M)
48		20" - Subsea Flange
48	80	Critical Section
90	100	Critical Section
117	384	Critical Section
391	400	Hardware, Subsea - Flange
440	447	Hardware, Subsea - Flange
447	773	Critical Section
1,216	1,240	Critical Section
1,986	2,258	Critical Section
2,579	2,609	Critical Section
3,024		Transition from 20" to 22"
3,204	3,212	Possible Geometric Defect
3,356		Offshore to Onshore, Transition from 22" to 14"
3,529	3,611	Change of material/thickness: 14" PEAD
3,611		Box 3, transition from 14" to 16"
3,611	3,664	0,5mm Thickness
3,664	3,789	Change of material/thickness: 2018-07 Repair
3,789		Unknown - Cathodic Protection Inspection
3,789	3,875	0,5mm Thickness
3,875	3,900	Change of material/thickness: section in Z
4,001	4,006	Hardware - Flange
4,412	4,415	Hardware - Flange
4,577	4,587	Critical Section
4,756	4,758	Hardware - ?
4,842	4,857	Critical Section
4,873	5,004	Pipe Type Change, 2001-12 On-shore section incident
4,918		Box 2
5,001	5,004	Hardware - Flange
5,655	5,666	Hardware - ?
5,801	5,802	Hardware, Tunnel
5,946	5,947	Hardware, Box 1



• Known Hardware



• Critical Sections



• Unknown Hardware



• Geometric Fault



• Structural Change



• Thickness variation

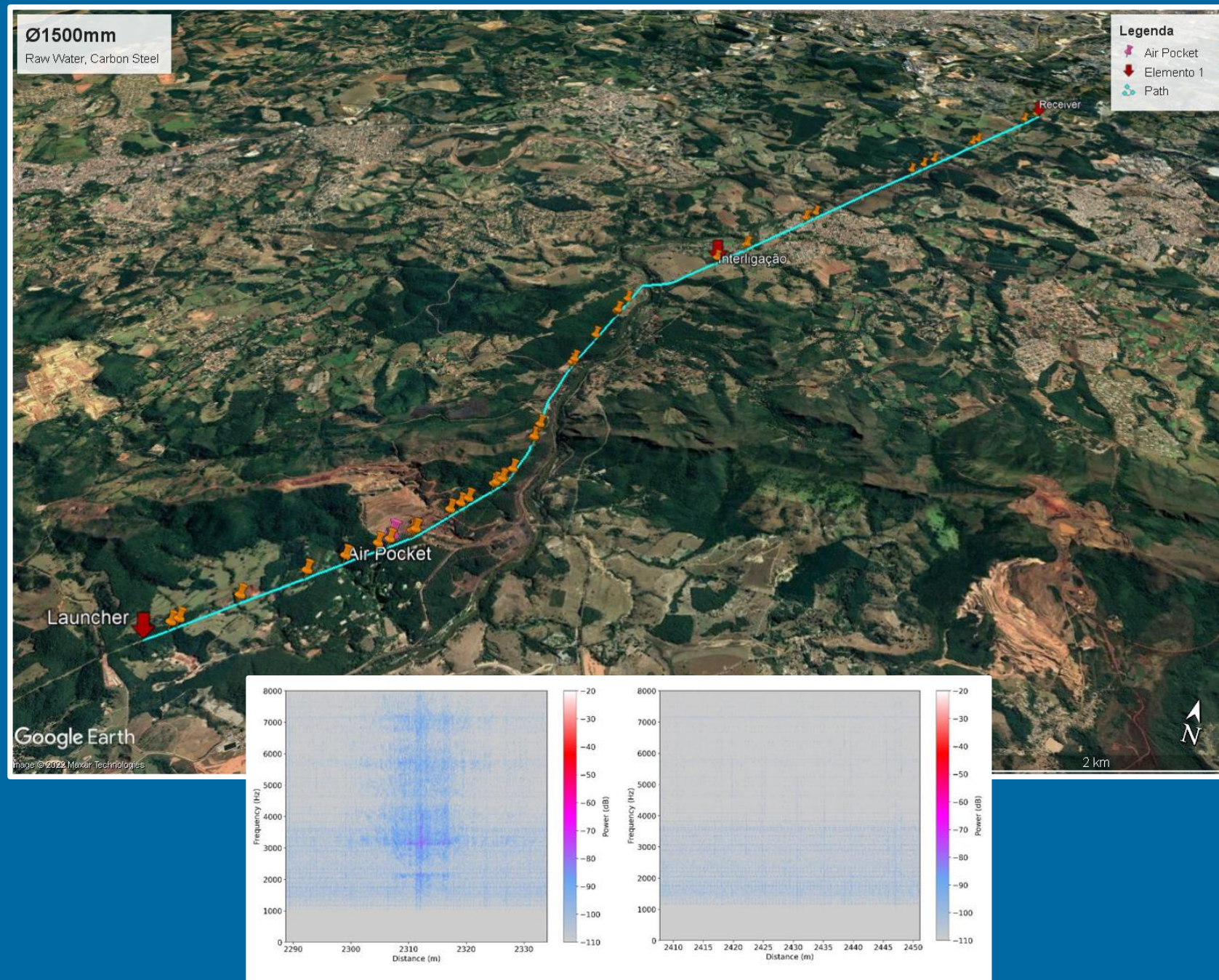




Leak Report

Data Evaluation

- Large pipelines, especially old ones, like most large pipelines in Brazil, have several small leaks, often already incorporated into “normality”. Using a tool that does not impact production, Orion can provide an accurate map of the points where the loss regions are located, with an accuracy of a few meters.

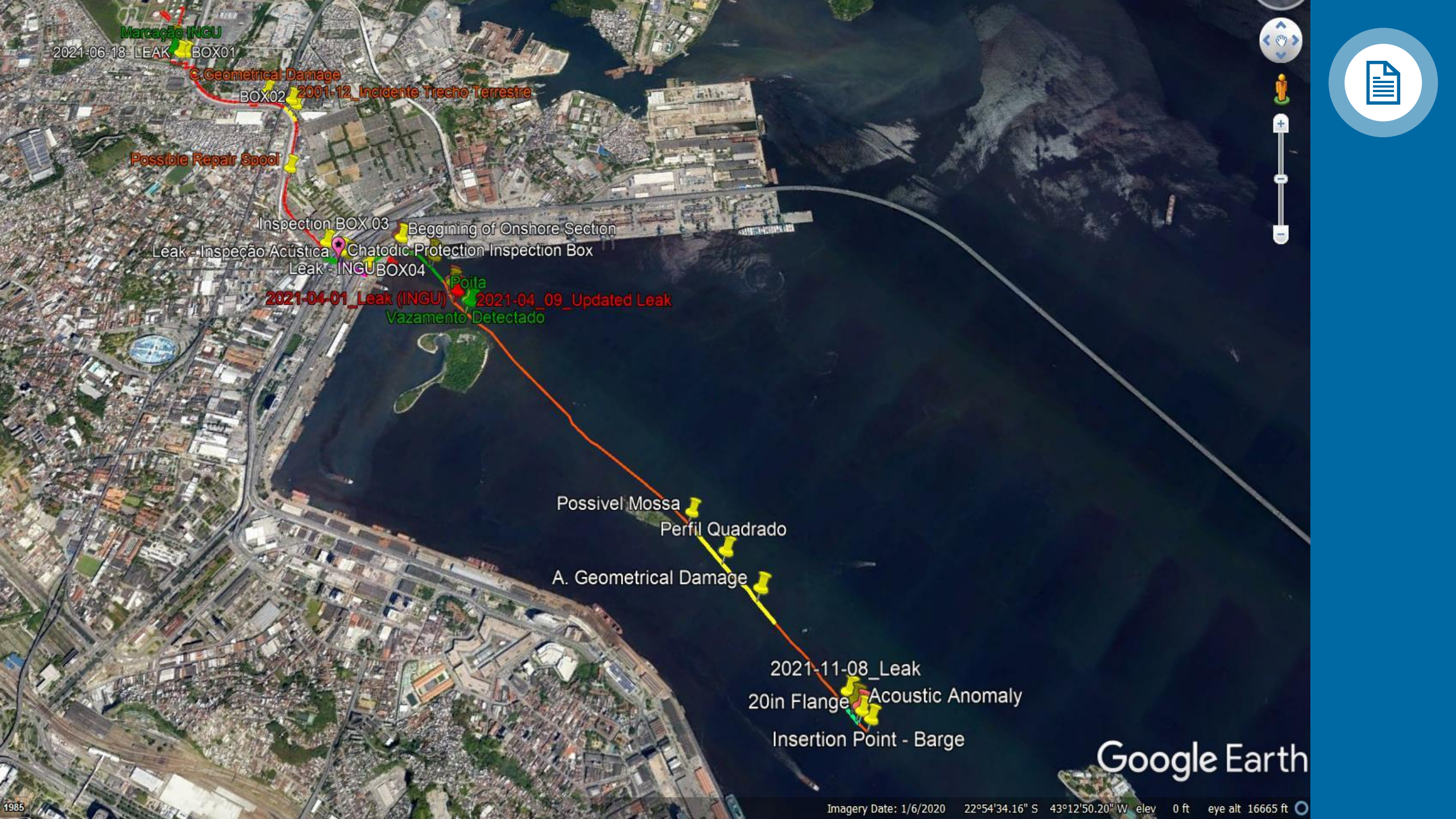




Integrity Reports Data Evaluation

- By integrating data from several inspections and collecting current integrity bases with first-rate tools, Orion performs the mapping of critical points in a pipeline, which allows the customer to pay extra attention to key points and prepare for a prompt answer. Applicable from sanitation industries to petrochemicals.

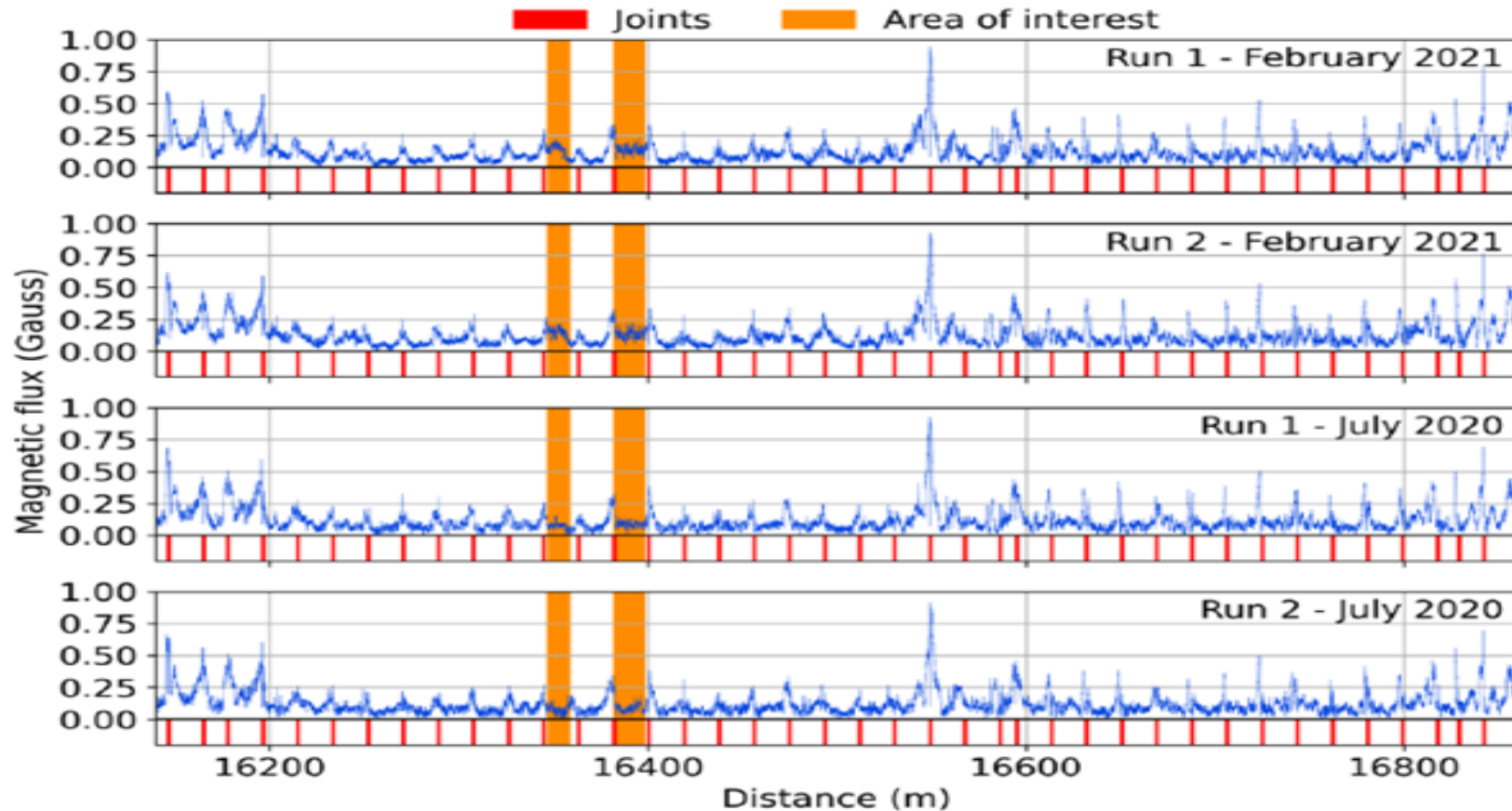




Google Earth

Integrity Program

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Repeatability and Integrity Inspection:

Here we have four inspections on the same pipeline, carried out in different months/years. What is observed is the repeatability of data referring to changes in wall thickness (generally associated with corrosive processes) can be detected by comparing inspections.





ORION

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