



Pathfinder – A new direction in pipeline proving and operational pigging performance management

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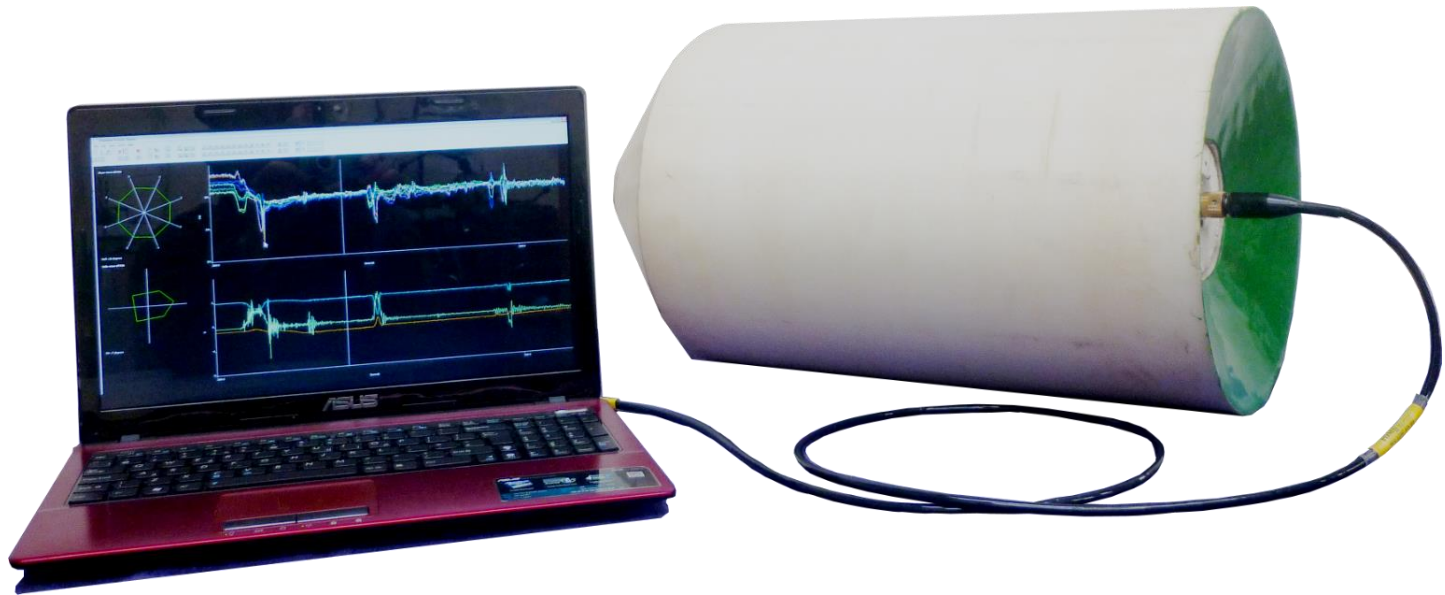
[www.pipeline-innovations.com](http://www.pipeline-innovations.com)



UK Based Company Specializing in the Design, Manufacture and Operation of Pipeline Bore Measurement Tools

- Pipeline Geometry Surveys
- Pipe Proving
- Debris Mapping & Assessment
- Pipeline Data Logging

# THE PATHFINDER FOAM CALIPER PIG



# 12" Refined Products Line

Naples, Italy



# PRODUCT DEVELOPMENT

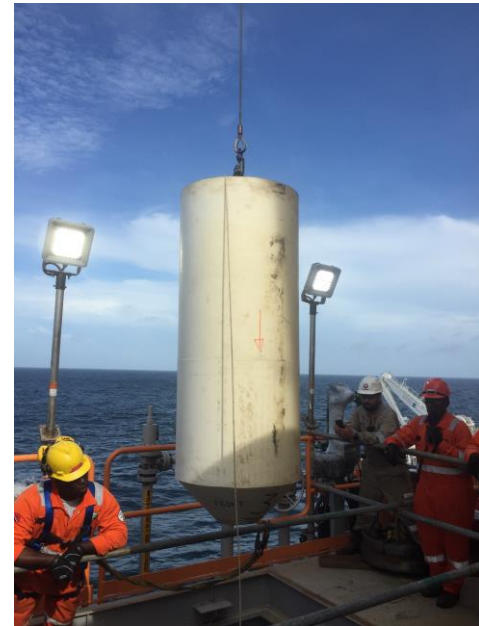


# Tool Sizes

4" to 26"



**4" – 8 Sensors**  
**Min Bore of 80mm**



**26" – 24 Sensors**



# Operating Parameters

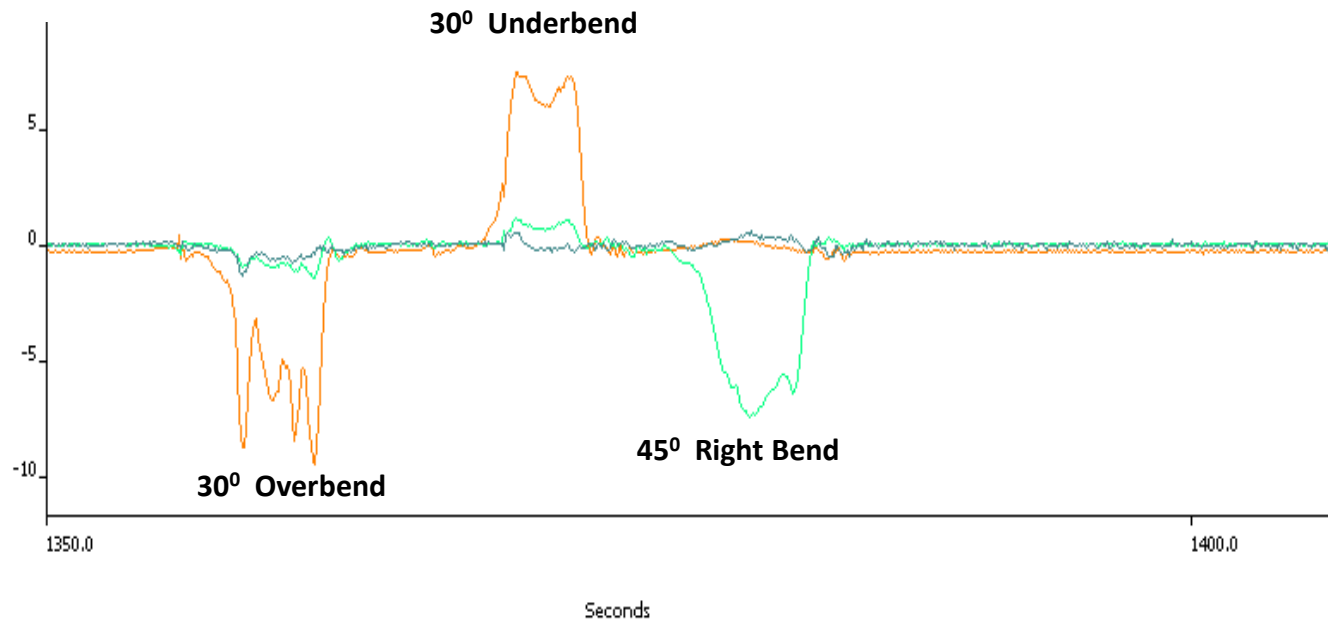
Pressure: Up to 400bar

Temperature: 0°C to 70°C

ATEX Certification: 6" to 18"



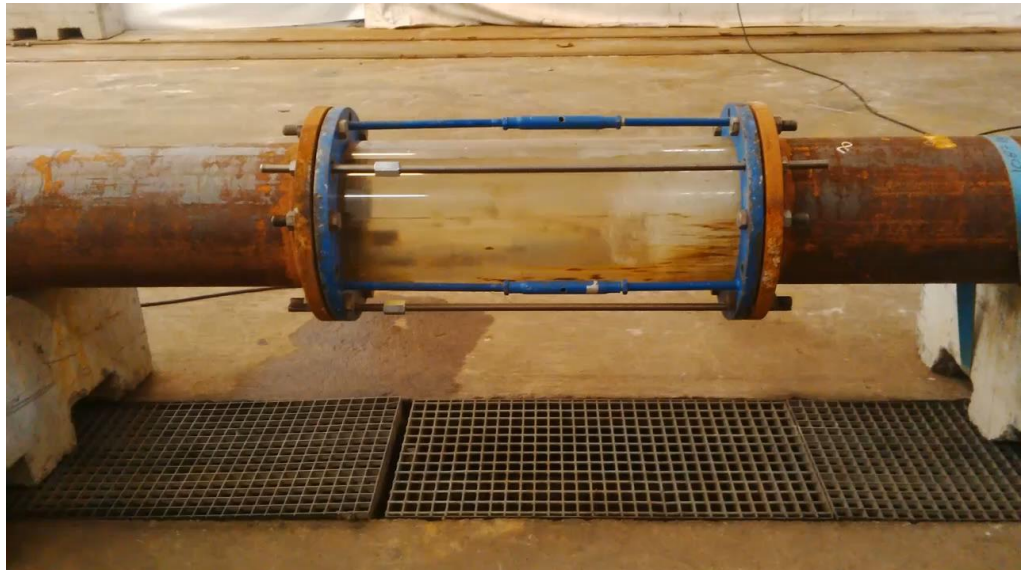
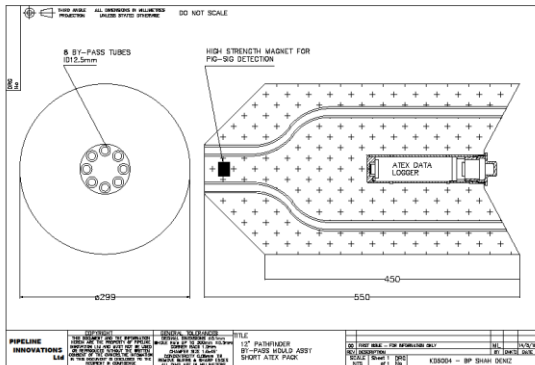
# Bend Measurement





# Bypass Jetting

## For Wax & Sand Deposits



**KLAB Test Facility, Norway**

## Bi-Di Pathfinder



# Ranger Pathfinder

## For Heavy Wall Deposits



# SERVICE PROVISION

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## Simple Tool Operation

- On site caliper technician not required
- Client saves money
- Reduces the offshore bed allocation problems

## Fast Response Remote Data Analysis

- First pass analysis & notification of significant defects within 24hr
- Issue preliminary report within 24hr
- Final report within 7 days

## Ultrafast Response Option

- Analyst on standby 24/7
- First pass analysis & notification of minimum bore within 6hr

# APPLICATIONS



# Pre-ILI Assessment

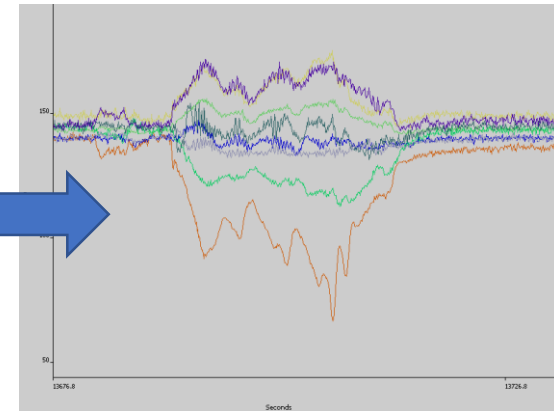
## 12" Crude Oil Pipeline Offshore Sicily



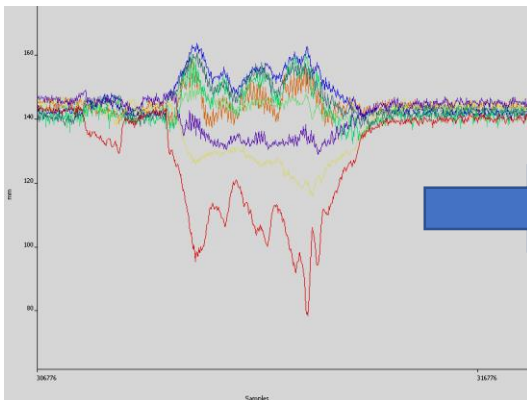
**Requires ILI Inspection but Pipeline has no run history**



**Pathfinder Run to Prove the Line**



**Large Restriction Identified**



**Repeat Runs Carried Out To Confirm Dimensions**

	Max Dent Depth (mm)	Maximum Bore Restriction (mm)	Estimated Length of Restriction (m)
Run 1	74	100	15.2
Run 2	63	86	13.4
Run 3	66	94	12.8
Average	68	93	13.8

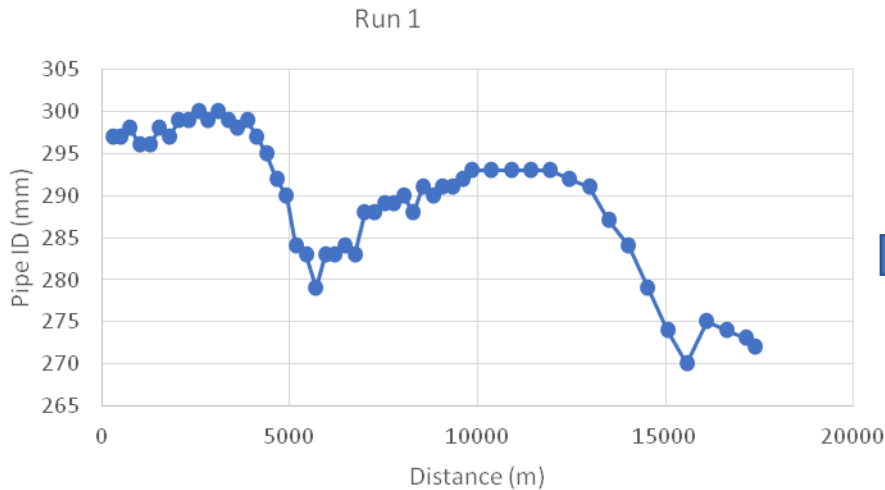


**Damaged Section Cut Out**



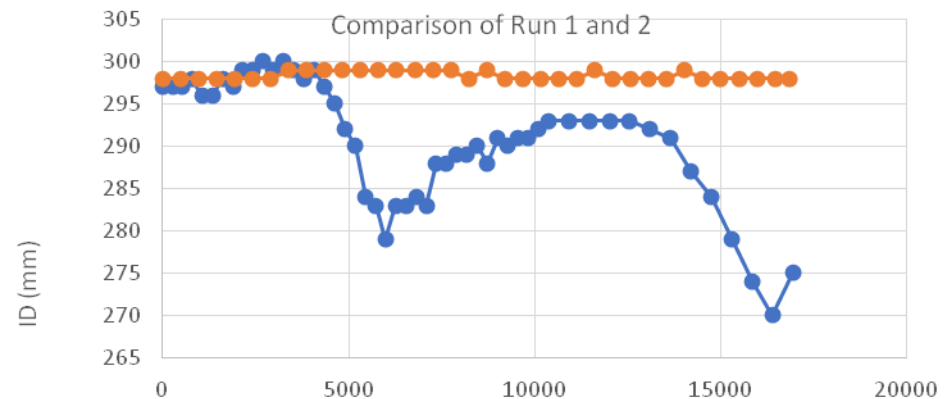
# Support Pipeline Cleaning Program

## 12" x 17km Crude Oil Pipeline



**Progressive cleaning programme**

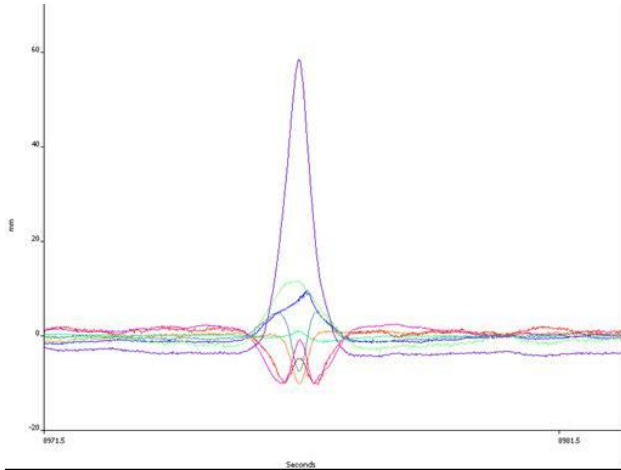
**Pathfinder Run Shows Distribution of Wax Thickness Along the Line**



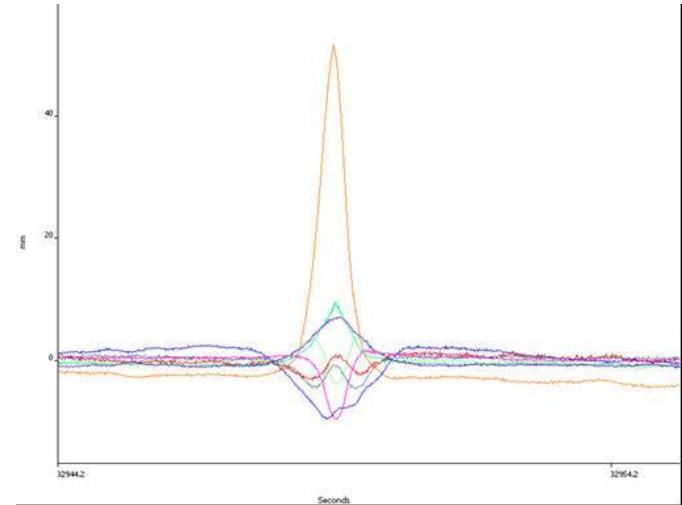
**Pathfinder Re-Run Shows That the Line Is Clear of Deposits Before Running ILI Pig**

# Pre-Com Gauging

14"/12" x 4km Pipeline Offshore Carribean



**Pathfinder Re-Run  
to Confirm**



**Pathfinder Identifies  
Buckle Type Response**

**Second Run Confirms Responses**

**Pathfinder Girth weld Count  
Identifies Location of Buckle**



**ROV Flyover Confirms Pipe Deformation  
At Given Location**

# Unknown Restriction Causing Pig Damage

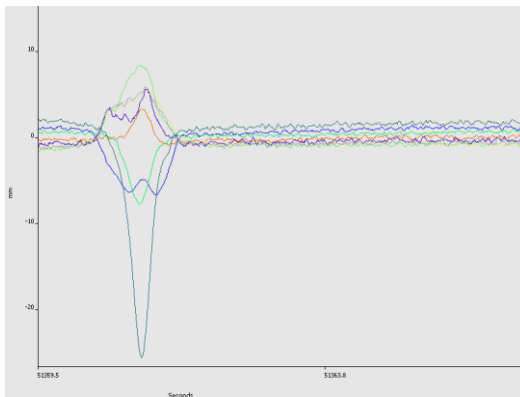
16" x 44km Pipeline Offshore Malaysia



**Scraper Damage During Pre-Comm**



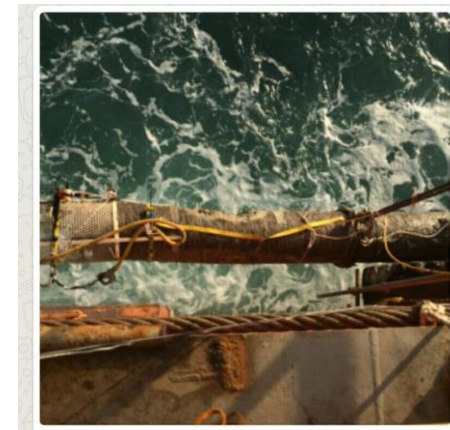
**Pathfinder Deployed**



**Pathfinder Identified Severe Dent**



**Location of Pipe Spool  
Containing Dent Identified**



**Pipe Excavated and Spool Cut Out**



# Unknown Restriction Causing Pig Damage

10" x 22km Crude Pipeline Onshore China



**Foam Cleaning Pig Damage**



**Dummy Pathfinder**



**Pathfinder**

**Pathfinder Identifies  
Multiple Severe restrictions**



**Pipe Excavated &  
Hot Taps Identified**

# PATHFINDER PERFORMANCE

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## Reliability

- 95% success rate
- Mechanical simplicity
- No external cables, wires or sensors
- Measurement system protected at the rear of the pig

## Survivability

- Medium/high density PU foam
- Stripped down to bare foam

## Range

- Longest run to date 260km in oil
- Longest run in gas 60km

# PATHFINDER TRIALS



## PRCI 4"/6" Test Loop Houston

Pathfinder accepted by Chevron for the TV Expansion Project in GOM



# PATHFINDER TRIALS



**CNOOC Test Loop, Tianjin, China**

Pathfinder accepted by CNOOC



- The Pathfinder was specifically designed for initial pipeline proving in lines with no pigging history and or potential reductions in bore due to debris build up where an operator plans to initiate a pipeline pigging or ILI campaign.
- Since 2013 and with continued development the Pathfinder is establishing a growing track record as a low risk, cost effective and innovative technology solution for measuring pipeline geometry, internal pipe diameter, detecting and measuring dents, ovality, buckles wrinkles and the presence of debris and pipe wall deposits not just in pipeline commissioning and proving workscopes but also more commonly in supporting operational workscopes including cleaning, pre inspection cleaning and debris assessment as part of a pipeline operators production pigging strategy



Pipeline Innovations Ltd

Thank you for your interest.

Any Questions?

[www.pipeline-innovations.com](http://www.pipeline-innovations.com)