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

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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

30° Underbend

30° Overbend

45° Right Bend
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

<table>
<thead>
<tr>
<th></th>
<th>Max Dent Depth (mm)</th>
<th>Maximum Bore Restriction (mm)</th>
<th>Estimated Length of Restriction (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run 1</td>
<td>74</td>
<td>100</td>
<td>15.2</td>
</tr>
<tr>
<td>Run 2</td>
<td>63</td>
<td>86</td>
<td>13.4</td>
</tr>
<tr>
<td>Run 3</td>
<td>66</td>
<td>94</td>
<td>12.8</td>
</tr>
<tr>
<td>Average</td>
<td>68</td>
<td>93</td>
<td>13.8</td>
</tr>
</tbody>
</table>

Damaged Section Cut Out
Support Pipeline Cleaning Program

12” x 17km Crude Oil Pipeline

Pathfinder Run Shows Distribution of Wax Thickness Along the Line

Progressive cleaning programme

Pathfinder Re-Run Shows That the Line Is Clear of Deposits Before Running ILI Pig
Pathfinder Identifies Buckle Type Response

Pathfinder Girth weld Count Identifies Location of Buckle

Second Run Confirms Responses

ROV Flyover Confirms Pipe Deformation At Given Location
Unknown Restriction Causing Pig Damage

16” x 44km Pipeline Offshore Malaysia

Scaper Damage During Pre-Comm

Pathfinder Identified Severe Dent

Location of Pipe Spool Containing Dent Identified

Pathfinder Deployed

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.
Thank you for your interest.

Any Questions?

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