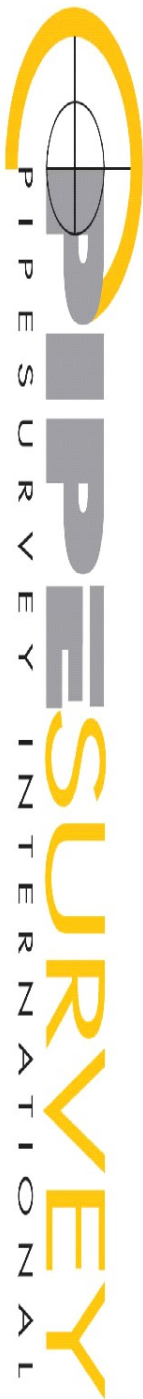# Inspection of non-piggable pipelines

PPSA pigging seminar
November 19th 2008

Pipesurvey International

Peter van Beugen, M.Sc.

Pipesurvey International

- Foundation: 2002
- Mission: high end technologies for pipeline integrity
- Free swimming camera tools
- Inertial geometry tools
- MFL tools

Inspection of non-piggable pipelines

- Ideal pipeline
- Constant cross section
- Straight sections
- No offtakes
- Constant flow
- Traps both sides
- Easy access

Inspection of non-piggable pipelines

Non-piggable pipelines

- Mechanical constraints
  - (a combination of)
  - Diameter variations
  - Bend radius
  - Pig traps
  - 'Dead-end' configuration
- Operational constraints
  - Low flow
  - Low pressure

Non-piggable pipelines

- Convert pipeline
  - Installation of mechanical work
  - Pipeline modification
  - Engineering & Cost

Non piggable pipelines

- Solutions

- Hydrostatic testing
- Pipeline out of operation
- Threshold test

Non piggable pipelines

• Solutions

Direct Assessment
(ECDA → ICDA)
- overline techniques

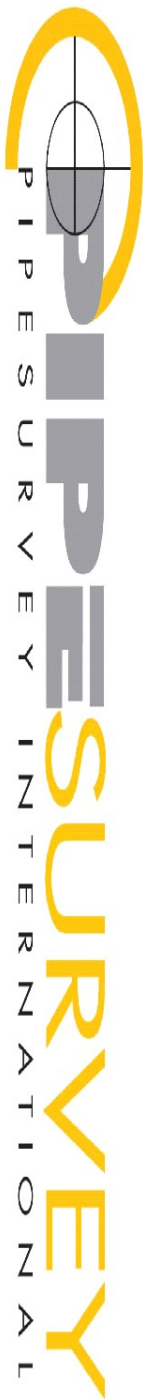- access

- level of detail

Non piggable pipelines

- Umbilicals

- Detailed and direct information
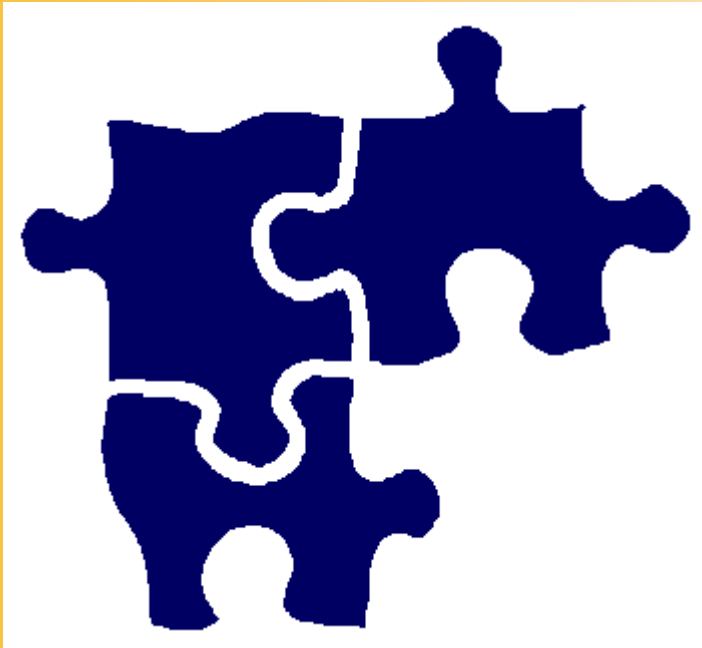- Number of bends
- Length of pipeline

Inspection of non-piggable pipelines

- Extending existing inspection technologies in the realm of non-piggable pipelines
  - Proven technology
  - Defect assessment
  - Minimize interference operation
  - Cost saving
  - New opportunities

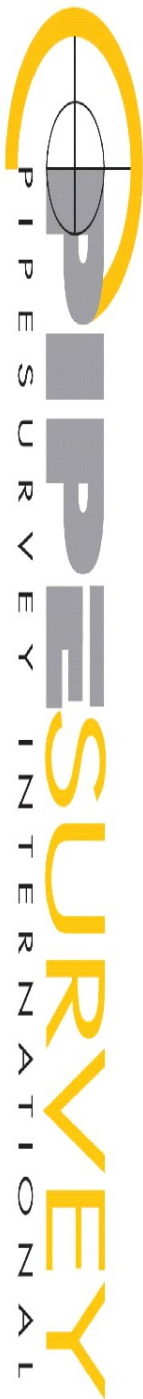# Inspection of non-piggable pipelines

- Wish list
  - Bi-directional operation
  - Multidiameter capability
  - High-wall thickness capability
  - Low friction
  - Short radius bends
  - Accuracy, ID/OD,
  - Velocity

Inspection of non-piggable pipelines

- Magnetic design
  - Mathematical model
    - C:\Documents and Settings\W Vos\Desktop\STUDIE\M-model.xls

Inspection of non-piggable pipelines

- Tri-axial Hall effect sensors
- ID/OD discrimination
- Signal quality
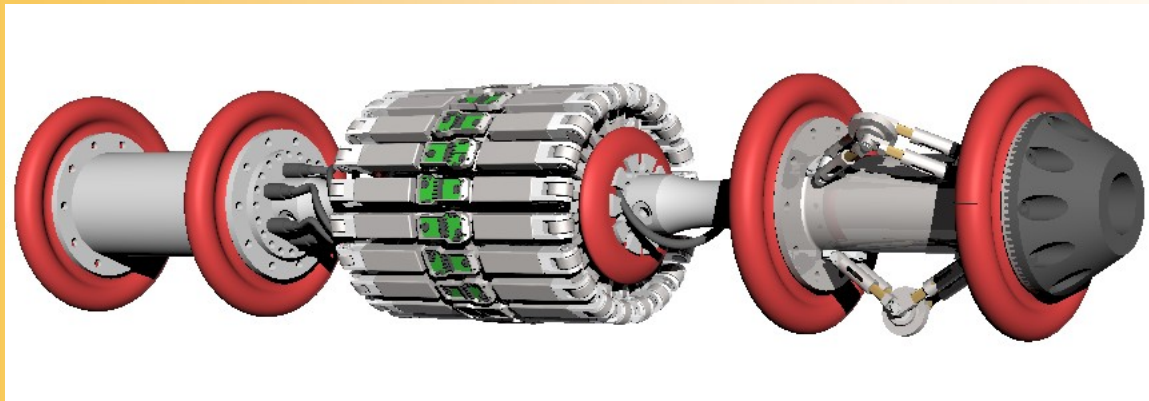- Lift-off
- 1,5 D radius bends

Inspection of non-piggable pipelines

- 25% diameter reduction

- Bi-directional design

- Low friction

- Gapless sensor arrangement

Inspection of non-piggable pipelines

- Bi-directional tool
- HR MFL technology
- Low velocities
- High wall thickness pipeline
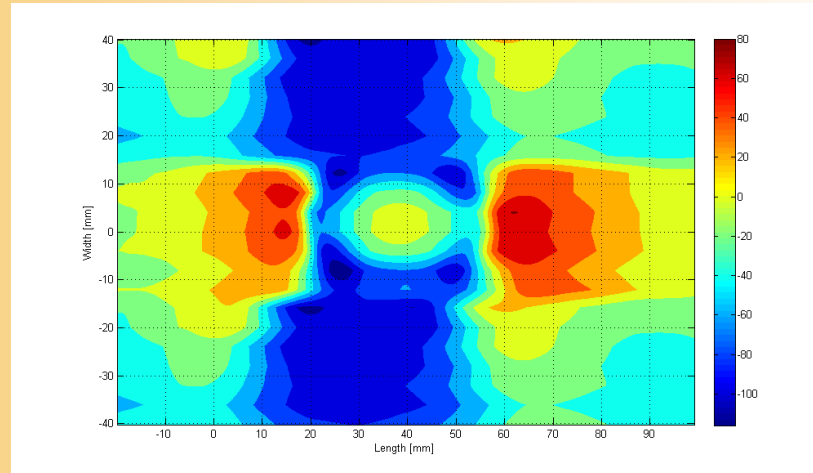- Multidiameter capability

Inspection of non-piggable pipelines

- Applications
  - Jetty lines
  - Tank farms
  - Sub sea pipelines
  - Transmission pipelines
  - Riser inspection
  - Industrial facilities

Inspection of non-piggable pipelines

- Data analysis
- Reporting
- Defect assessment methods
- Software
- C:\Documents and Settings\W Vos\Desktop\PETER\Caliper Demo 12 january 2007\Demo CD\Receive_Demo\Pipesurvey.exe

Inspection of non-piggable pipelines

End of presentation