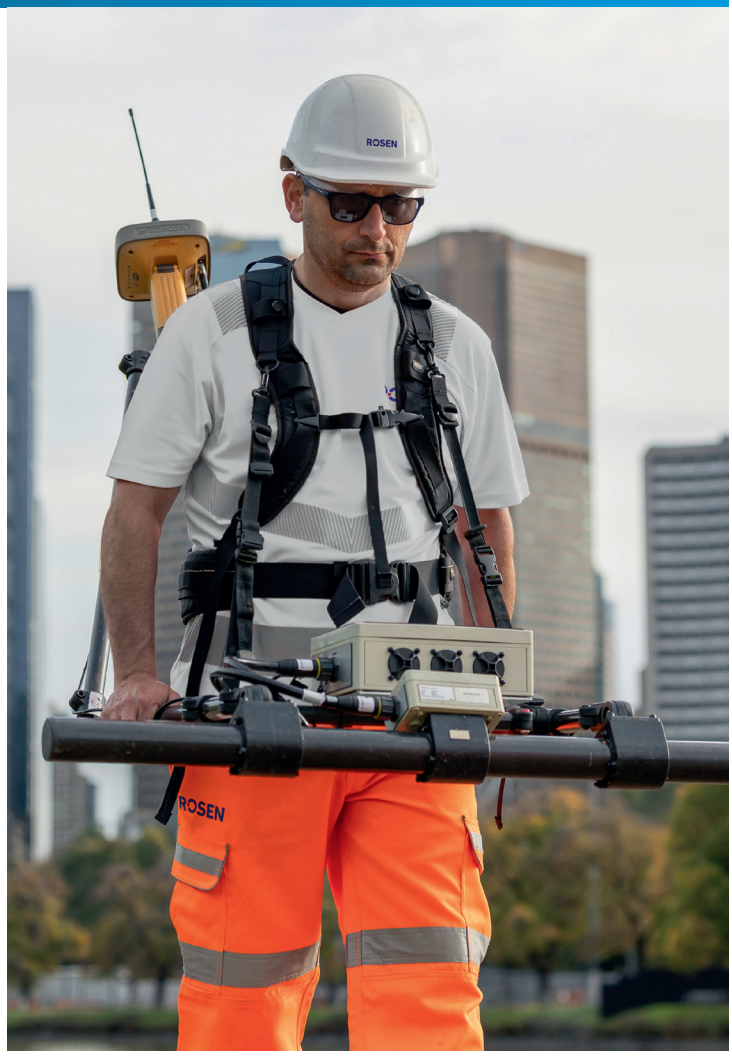
Large Stand-Off Magnetometry (LSM) Inspection

Above-Ground Inspection of Unpiggable Pipelines

- Prioritization of excavations and targeting of most critical defects
- Monitoring of anomalies to detect critical changes early
- Completely non-intrusive with no impact on pipeline operations
- Prioritization of pipelines for ILI or Estimated Remaining Life (ERL)

Large Stand-Off Magnetometry (LSM) is a non-intrusive, above-ground inspection method based on the science of stress magnetization. LSM can locate buried pipelines and detect anomalies in the pipeline's magnetic field. An engineering evaluation based on the magnetic data determines the position and infers an accurate stress value at that point in the pipeline. Since any mechanical or metallurgical defect will result in localized stress zones in the pipeline wall, LSM can detect almost any defects that affect pipelines.

During an LSM inspection, a technician or drone carries the scanner directly over the center of the pipeline as the scanner passively collects magnetic data of the pipeline. There is no need to introduce energy into the pipeline, turn off cathodic protection (CP) systems or change the operating parameters of the pipeline during the inspection. Once the field survey is complete, the software analyzes the pipeline magnetic data to either map the pipeline location, or use complex algorithms decipher the mathematical relationship between material stress and magnetization. The software reports the location of the pipeline and any abnormal zones of localized stress in the pipeline reported as a MPa or material %SMYS.



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Benefits

- High-precision definition of the location of stress concentration zones (SCZs) and magnitude of stress caused by:
  – stress corrosion cracking (SCC)
  – weld defects
  – stresses caused by ground movements, e.g., subsidence
  – landslip and washouts
  – internal and external corrosion and metallurgical defects
- Detects the location of changes in pipeline wall thickness, diameter, and beginnings and endings of casings
- Generation of a high-precision 3-dimensional map of the pipeline route for use in geographic information systems (GIS)
- High-precision location of girth welds over short lengths (to assist in identifying excavation locations)
- Active monitoring of defect behavior and pipeline movement

Technical Specifications

Scope	Diameter of surveyed pipelines	152 mm – 1820 mm (6" – 72")
	Distance between scanner and pipeline (axial deviation, laying depth)	Optimal distance up to 12 times pipeline diameter, e.g. ~ 3 m (9.84 ft) for 10"
Sensing		Passive magnetic technology
Accuracy	Laterally	Within 100 mm (0.33 ft)
	POD	> 80 % at a confidence of 95 % (where no magnetic interference is encountered)
	Mapping	± 5 % to actual position

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ROSEN-Group_Serviceflyer_Large-Stand-Off-Magnetometry-Inspection_v1-0_2024