



trecoil Srl

**HIGHEST QUALITY PIPELINE SERVICES
PROUD ITALIAN EXCELLENCE**

TRECOIL S.R.L.



INLINE INSPECTIONS OF OIL & GAS PIPELINES

Trecoil S.r.l. carries out **geometric inspections** and **testing pipeline** at the main customers in the oil and gas market and quality, safety, environment and energy training activities.

Our team is a group of experienced and well trained professionals who know how to get things working. Although we are a young company in inspection area, most of us have long time experience in working with intelligent pipeline tools.

FROM 6" TO 56" PIPELINES
CALIPER PIGS SINGLE-CHANNEL AND MULTI-CHANNEL - MFL TOOL



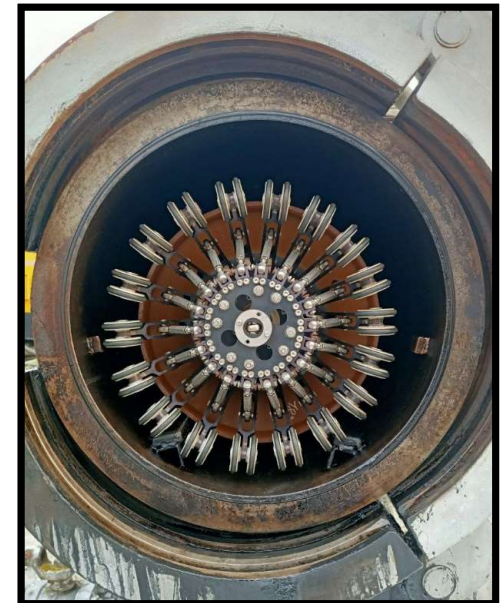
ENGINEERING SERVICES FOR OIL & GAS COMPANIES

Execution of **job coordination activities** on behalf of engineering companies working for the oil, gas, petrochemical and power industries, not to mention the **assistance for every phase of the hydraulic pipeline test**.

In addition, the considerable and updated knowledge we have gained from our continuous contacts with the major manufacturers allows us to offer good support for any **local procurement activity** or market research. The company offers also safety classes and mentoring.

PROJECT MANAGEMENT CONSULTING

OUR SERVICES



INSPECTION TOOLS

SINGLE-CHANNEL CALIPER PIG

Our Caliper Pig Single-Channel detects pipeline's diameter reductions and variations such as dents, ovalities, circumferential welding and wall thickness variations, which reduce the internal diameter of the pipe.



MULTI-CHANNEL CALIPER PIG

The Multi-Channel Caliper Pig implements the ability of sizing and positioning the differentiation longitudinal and circumferential of the different types of defects.



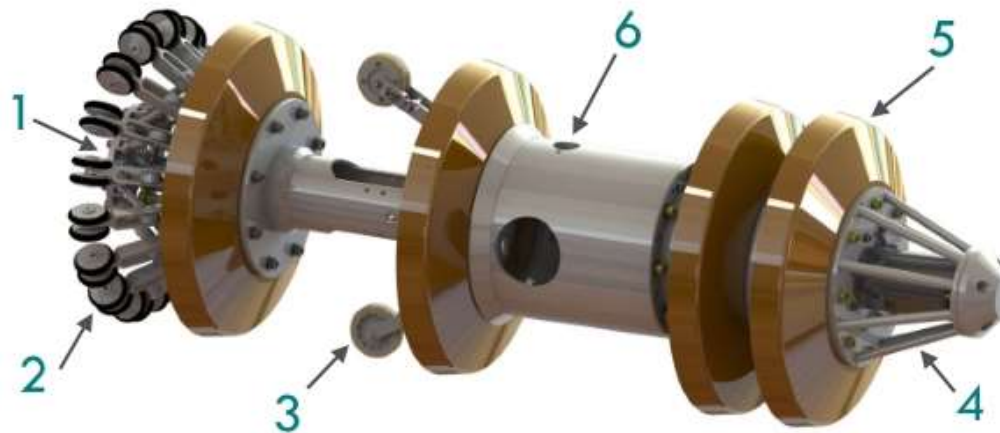
MAGNETIC FLUX LEAKAGE

The MFL inspection activity detects metal losses, pitting (internal and external), and cracks. Also it provides inertial mapping (X, Y, Z) of the pipeline and measurement of the voltages induced by the movement of the ground.



CALIPER PIG

PRINCIPLE OF OPERATION



The Caliper Pig measures **diameter reductions** in pipelines such as dents and ovalities. Even **diameter variations** like girth-welds, wall thickness changings, T-pieces, valves and other installations are detected.

1.	Transmission disc
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2.	Sensing fingers
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3.	Odometer wheel
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4.	Locator unit
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5.	Drive cup
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6.	Digital data recorder
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CALIPER PIG MEASUREMENTS



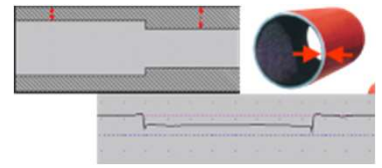
DENTS



OVALITIES



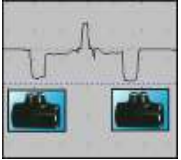
GIRTH-WELDS



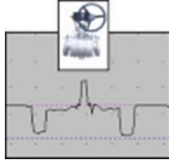
WALL THICKNESS CHANGINGS



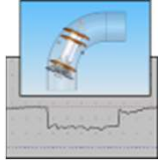
T-PIECES



VALVES



BENDS



OTHER INSTALLATIONS

CALIPER PIG

FUNCTION



The Caliper Pig continuously measures the **inside diameter of the pipeline** through an array of sensing fingers ("spiders") that are spring loaded to hold them in contact with the pipe wall. A large number of sensing-fingers provide optimum coverage of the inside circumference. Wheels at the end of each sensing-finger are in direct contact with the pipe wall. The extremely flexible polyurethane cups enable the Caliper Pig to be transported through the pipeline by the medium. The Caliper Pig is able to pass reductions of at least 25%.

The spider is separate from the cup to eliminate effects from cup wear. As the Caliper Pig moves through the pipeline, all **radial sensor movements** are detected and recorded. ID-reductions of 0.4% will be detected.

Odometer wheels generate the distance data which in addition to the measuring data from the spider is continuously collected and stored together with the correlative diameter values.

To locate the Caliper Pig in the launcher, receiver or during survey, a **locator unit** is used. The locator unit transmits electromagnetic signals which will be detected by an external inspection tool locator. A pushing flange is used to push the Caliper Pig into the launcher and to protect the spider against mechanical damage.

The **data-recorder** contains all power, processing and recording circuits in a sealed module within the central body of the Caliper Pig.

CALIBRATION

Prior to the survey the Caliper Pig is calibrated by using a calibration ring and simulating dents and ovalities with small blocks of specified thickness. These calibration outcome is used to draw the calibration curve, which forms the basis to determine the diameter reduction which corresponds to the deflection on the chart.

The calibration will be done in 2.5 or 5 mm steps. Each survey chart shows a dent-calibration and a ovality-calibration at its beginning.

CALIPER PIG

DATA ANALYSIS AND INTERPRETATION

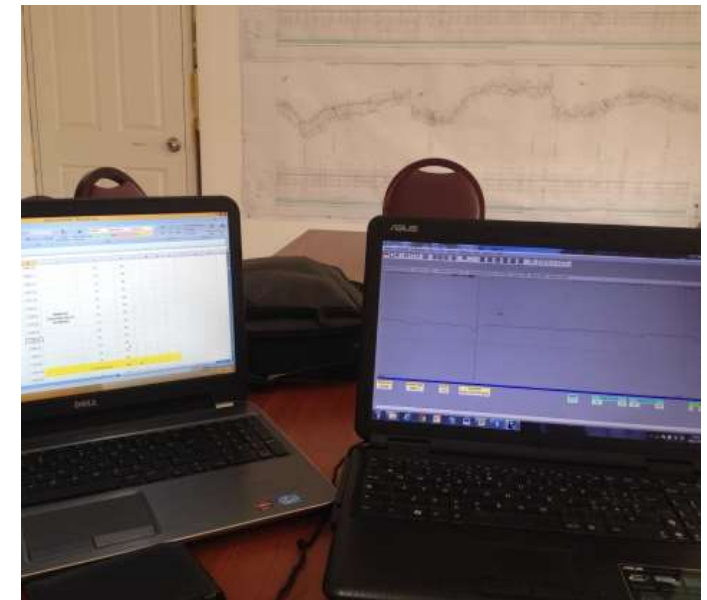
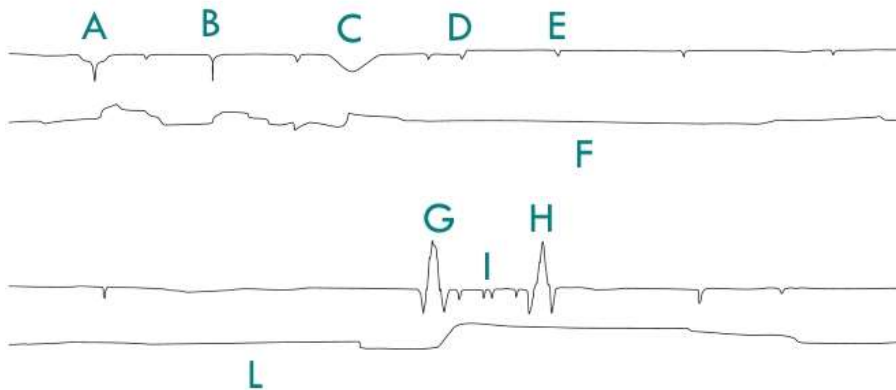
ANALYSIS

During the survey the Caliper Pig data are gathered in the solid state memory inside the recorder. After the run a laptop computer is connected to the Caliper Pig to download the data. The visualization of the survey chart is done on the laptop itself. The interpretation of the complete survey data will be done directly on screen. All interesting details are marked in the chart and a printout is added to the report.

INTERPRETATION

Before interpretation begins a minimum acceptable diameter reduction is agreed with the customer. The interpreter scans the chart for deflections which exceed the agreed value and compiles a features list. All indications exceeding the agreed value and also pipeline features like valves, T-pieces, wall thickness changes, girth-welds, bends and other installations are listed.

The following examples show typical pipeline features:



- | | | |
|---------------------------|----------------|-------------|
| A – Ovality with dent | B – Dent | C – Ovality |
| D – Wall thickness change | E – Girth-weld | F – Speed |
| G – T-piece | H – T-piece | I – Valve |
| L – Speed | | |

CALIPER PIG

FINAL REPORT

The Data Analysis Department consists of experienced people who work close together with the customer and service technicians.

The Final Report generally contains the data listed in the table.

The **General Information** provides details like names of the pipeline owner, the surveyed pipeline and the names of representatives and technicians.

Technical Data shows all important data concerning the pipeline the Caliper Pig and the survey run.

Details of how the job was carried out, principles of dates of the survey and progress of the job are given under **Survey Procedures**.

The **Results** are summarized in the features list. It contains several columns with all the important notes of the run.

Supplementary to the features list the calibration curves and the entire **Printout** of the chart is provided.

1.	General informations
2.	Technical data
3.	Survey procedures
4.	Results
5.	Features list
6.	Calibration curves
7.	Printout of the chart

DRYING

Drying the pipeline ensures the complete elimination of water and of left humidity which naturally forms inside the line.

This operation prevents contamination or the dilution of transported fluid and represents one of the best practices for managing and keeping the pipeline in best possible state.



NITROGEN PURGING LINE

Nitrogen purging line implies letting nitrogen in the line in order to prevent explosions, taking advantage of the absence of reactivity of nitrogen.

This operation prevents internal corrosion of the structure and allows to keep the line in a perfect state of maintenance.



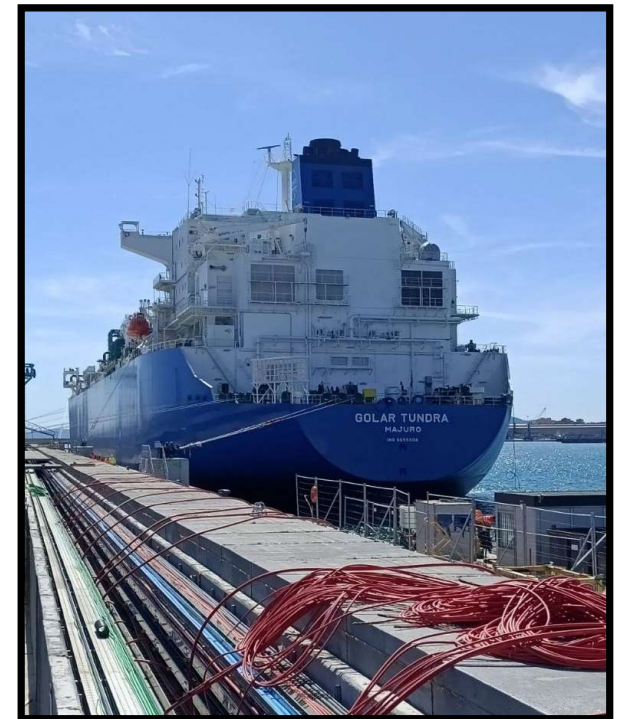
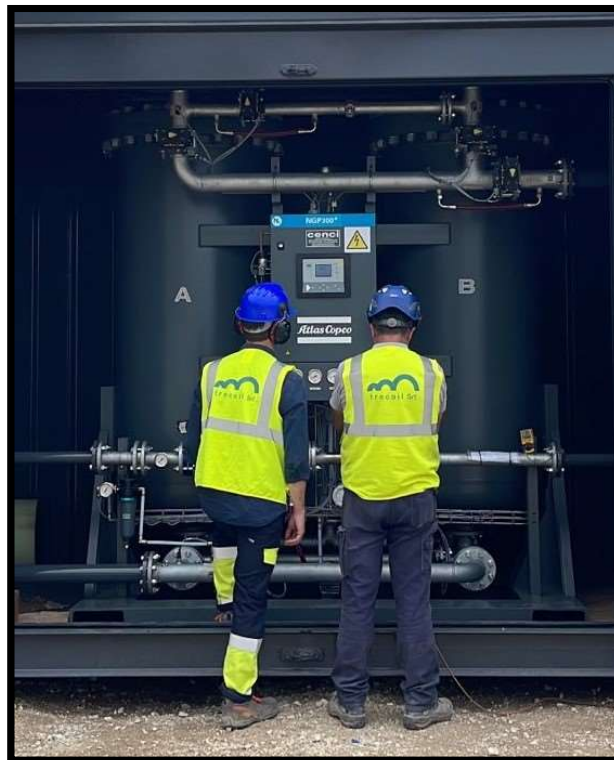
CLEANING

The operation of cleaning is carried out with bi-directional pigs and their passage through the line. It allows to remove residues which may be present inside the line and to prepare the best set for successive geometrical-dimensional inspections or maintenances such as drying and nitrogen purging.

Cleaning may be addressed to metallic residues as well, by equipping the pig with a magnetic belt.



OUR PROJECTS



CONTRATTO APERTO – ISPEZIONE CON PIGS OLEODOTTO DN250 (10») SAVONA DEPOSITO – PIATTAFORMA OFFSHORE

Cleaning, Gauging, Caliper Pig Inspection , Magnetic Flux Leakage Inspection and Inertial Mapping Services



PIPELINE DN 400 (16") CENTRALE "FEDERICO II" BRINDISI NORD-BRINDISI SUD

CLEANING, GAUGING, DEFORMATION, INERTIAL MAPPING SERVICE AND MAGNETIC FLUX LEAKAGE INSPECTION (MFL)

LENGTH: 11500 METERS



CLIENT

Enel Produzione S.p.A.



CONTRACTOR

Enel Produzione S.p.A.



LOCATION

Italy



TIME

August 2016



PIPELINE DN 1400 (56") ZIMELLA-CERVIGNANO, DP 75 BAR STEP 1



CLIENT

S.A.L.P. S.p.A. - I.CO.P. S.p.A.



CONTRACTOR

SNAM Rete Gas S.p.A.



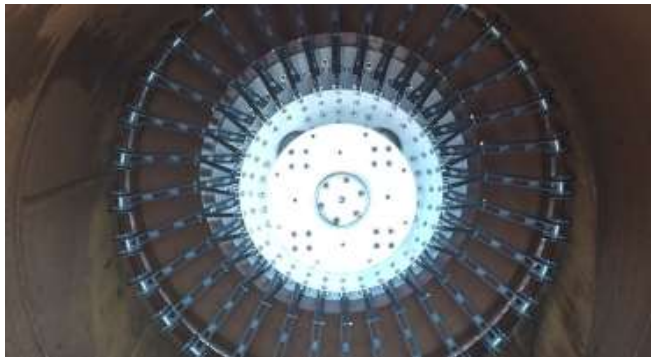
LOCATION

Italy



TIME

May 2015



GAS PIPELINE DN 1400 (56") ZIMELLA-CERVIGNANO, DP 75 BAR STEP 9, 10 & 11



CLIENT

Bonatti S.p.A.



CONTRACTOR

SNAM Rete Gas S.p.A.



LOCATION

Italy



TIME

October 2014



PIPELINE DN 400 (16") FROM GONARS TO TORVISCOSA



CLIENT

Edison Energia S.p.A.



CONTRACTOR



LOCATION

Italy



TIME

August 2014



NATURAL GAS PIPELINE BOTAŞ CONSTRUCTION PROJECT FROM SAKARYA TO KARASU



CLIENT

Hitaş İnş. ve Tic. Ltd. Şti.



CONTRACTOR

BOTAŞ - Petroleum Pipeline Corporation



LOCATION

Turkey



TIME

October-November 2013



GAS PIPELINE DN 12" FROM LARINO TO CHIEUTI (LENGTH: 46357 METERS) STEP 1 & 2



CLIENT

Romana Costruzioni S.p.A.



CONTRACTOR

SGI S.p.A.



LOCATION

Italy



TIME

November 2012



OUR MAIN CLIENTS



SICIM S.P.A.



GEKO S.P.A.



CII GUATELLI S.P.A.



SORGENIA S.P.A.



EDISON S.P.A.



SICILSALDO S.P.A.



NUOVA GHIZZONI S.P.A.



MAX STREICHER S.P.A.



ROMANA COSTRUZIONI S.P.A.



PETRA S.R.L.



S.A.L.P. S.P.A.



GRUPPO API



A2A S.P.A.



CAZZARO S.P.A.



TRE COLLI S.P.A.

QUALITY



QUALITY CERTIFICATION – ISO 9001

AENOR is a founder-member of IQNet, (International Certification Association), the largest international association of management systems certification bodies, whose international market share is estimated to be around 50%.

Along with its certificates and management systems marks, AENOR also issues the **IQNet certificate**, which provides organizations with a unique certificate that is widely recognized and respected in all international markets.



SAFETY



SAFETY CERTIFICATION – ISO 45001

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ENVIRONMENT



ENVIRONMENT CERTIFICATION – ISO 14001



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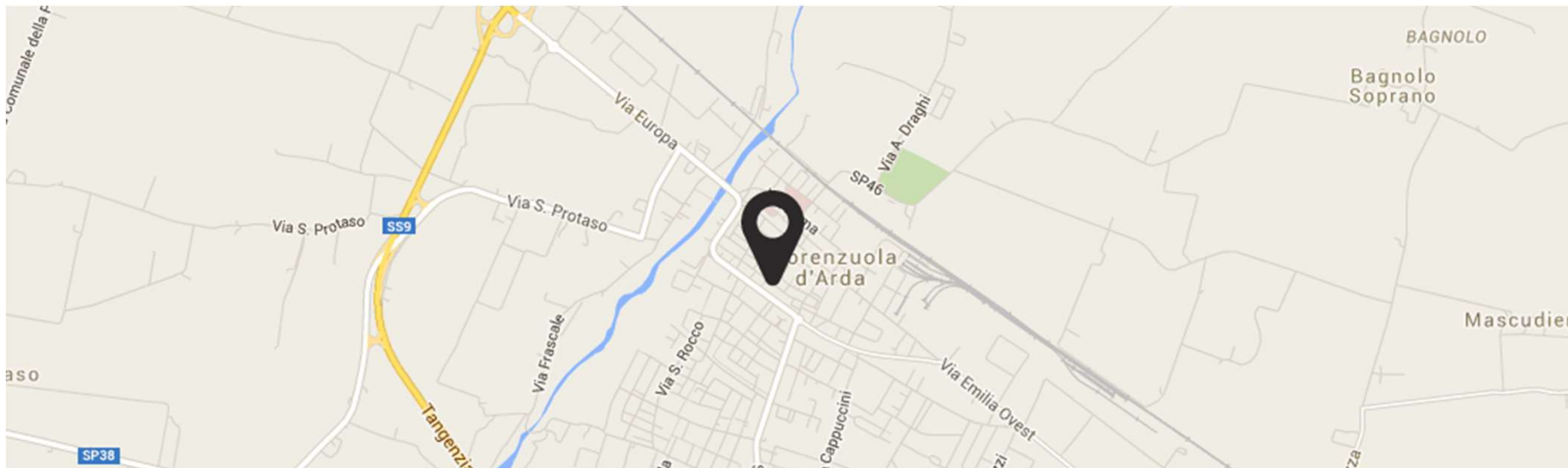


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