

ARKALINE, ARKA OIL & GAS PIPELINE Co.

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8" to 56"

PIPELINE INSPECTION BY INTELLIGENT PIG

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**ARKALINE**

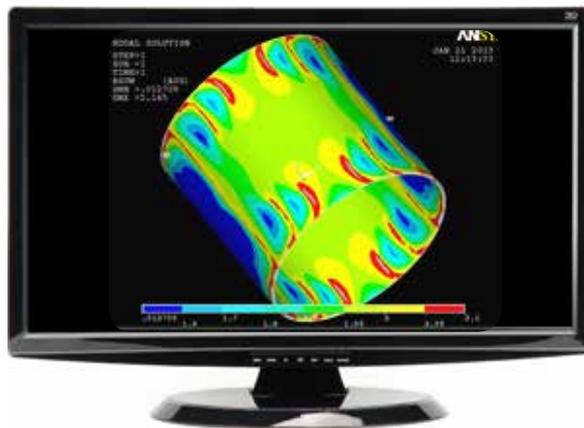
PIPELINE INSPECTION BY INTELLIGENT PIG



## About us



✿ The first research and development work in inline inspection of pipelines (ILI) at Middle East region started since 1993 at reputable universities. ILI technology along with different types of Smart Pigs were developed. Today ARKALINE Company uses various Smart Pigs to inspect oil and gas pipelines. The ARKALINE Company's experience includes technical consulting and inspection of several thousands of kilometers of oil and gas pipelines with different sizes. With having such a great experience, ARKALINE Company is proud to have a beneficial collaboration with satisfaction and confidence with different oil and gas companies. ✿



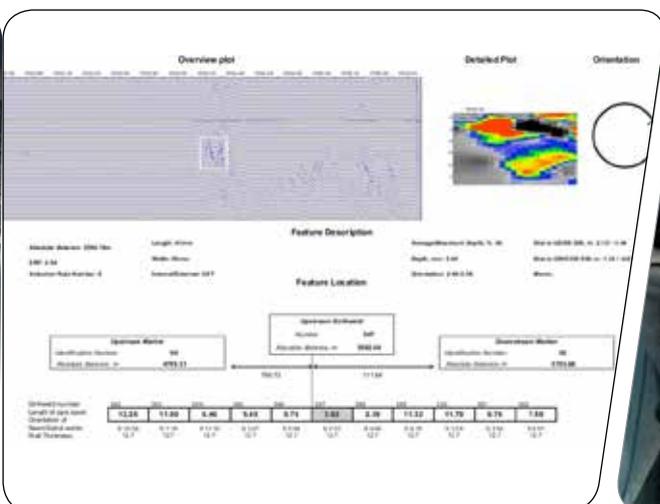


## Pipeline Survey by Intelligent Pig

Oil and gas pipelines are the main arteries of the oil and gas industry and are responsible for continuous and safe delivery of our energy needs. Early detection of pipeline defects is very crucial in preventing any kind of leakage and explosion by performing timely maintenance procedures. Smart Pigs are the best and most comprehensive equipment which are used for inspection, defect detection and also identification of the technical specification of the pipeline. For these reasons, they are widely used in oil and gas industry. Smart Pigs are specialized equipment that move with

the fluid inside the pipeline and perform a thorough pipeline inspection to identify any defects in the pipeline and also determine technical specification of the pipeline. Arkaline Company uses Magnetic Flux leakage technology for detection of defects related to Metal loss. Along with this technology, the company has also developed two other technologies of Caliper and Geo to detect geometric defects and geographical locations. Arkaline Company provides full chain pipeline inspection services using four types of Smart Pigs for all sizes of 8 inches to 50 inches.

- 1- MFL: Magnetic Flux leakage
- 2- TFI: Transverse Flux Inspection
- 3- Caliber: EGP (Electronic Geometry Pig)
- 4- GEO PIG: GEOgraphic PIG

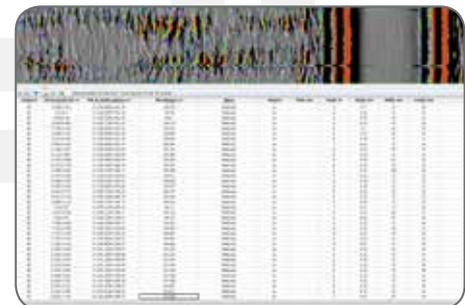
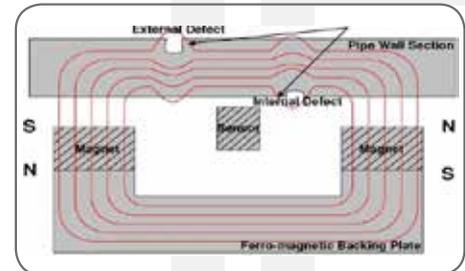




## PIMKA, MFL: Magnetic Flux leakage

Arkline's PIMKA Smart Pigs are designed and manufactured based on MFL technology. MFL is one of the oldest and the most used equipment in the inspection of pipelines. This type of Pig has been developed extensively over the years and has become one of the most precise ILI equipment. Arkline's PIMKA Smart Pigs have measurement accuracy of "high resolution" and "Extra high resolution". MFL is capable of detecting the most extensive pipeline defects including:

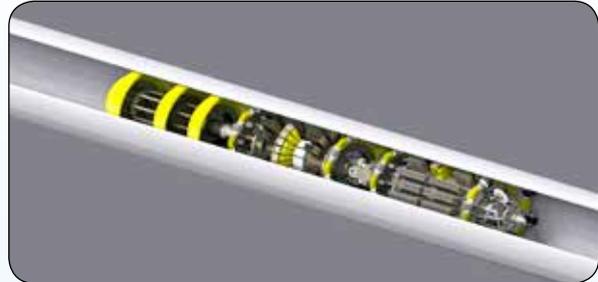
- General Corrosion, pitting,
- circumferential cracks, Gouges,
- dent, scratches, girth weld anomalies

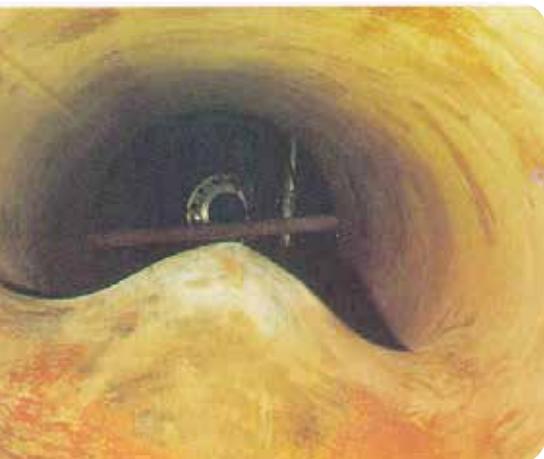


## ***PITKA, TFI: Transverse Flux Inspection***

Arkaline's PITKA Smart Pigs have been designed and manufactured based on magnetic flux leakage (MFL) technology with TFI (Transverse Flux Inspection) type. These types of Pigs work by creating circumferential magnetic flux on the pipeline. Therefore, they have a high potential in detecting defects in the longitudinal direction of the pipe such as:

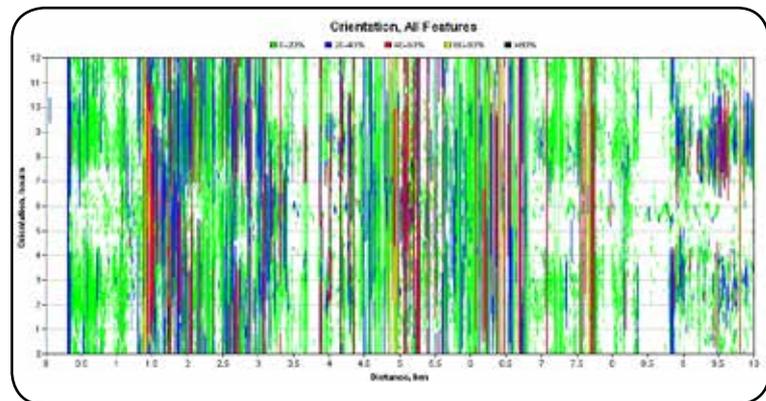
- **SCC. Axial crack**  
**longitudinal weld seam defect.**





### PICKA, Caliber: EGP (Electronic Geometry Pig)

PICKA or Caliper is a type of Smart Pig that is used to measure the internal pipeline geometry. Caliper is equipped with multi-channel mechanical arms and measures the whole 360 degree of the internal dimensions. Each arm is equipped with sensors that measures the arm displacement. Therefore, Caliper is capable of measuring the internal dimensional specifications of the pipeline. In addition, it can detect geometrical defects such as adents, ovalities, gouges and etc. It is also used to detect defects due to the installed parts or elements on the pipe such as check valves, pig signaler and etc.





## GEO PIG: GEOgraphic PIG

Arkline GEOPig uses INS (Internal Navigation System) technology. These types of smart pigs can detect the change in its spatial position and the rotation around all the three XYZ spaces. Therefore, this type of Smart Pig is capable of spotting its location with geographical coordinates of the beginning and end of the pipeline with higher accuracy (sub meter). The Arkline Company's GeOPig service can be provided as a separate smart Pig alone or in combination with other PIMKA, PITKA, PICKA Smart Pigs. Knowing the three dimensional path of the pipeline and the geographic location of all existing elements such as welding points, valves and potential defects, play an important role in the optimized operation, repair and maintenance of the pipeline (Pipeline Integrity). If excessive stress and load is applied to the pipeline due to natural disasters, it is possible to calculate these events by GEOPig and apply them in FFP and FFS process.





### Utility & Cleaning PIG

Arkline Company develops and offers a variety of Utility Pigs for the purpose of cleaning the pipeline, pre-commissioning and assessing successful passing of Pig through the pipeline. These Pigs are designed and built in accordance to the requirements of the user and pipeline conditions.

- *BI-DI Cleaning pig*
- *Magnet brush pig*
- *Gauging pig*
- *Cup brush pig*
- *Batching pig*
- *Magnet plus pig*



## Demagnetizer

Arkline Company recommends using PDM1 machine in order to neutralize the magnetic field created by Pigging. This device measures the magnetic field at the welding location and creates an equal and opposite magnetic field in order to neutralize the residual magnetic field. The remaining

magnetic field after using the device will be less than 2 Tesla. If the remaining magnetic field is not neutralized, certain fundamental problems will arise as a flaw in the welding quality during the maintenance and this can be dangerous.





### FFP (Fitness For Purpose) & FFS (Fitness For Service)

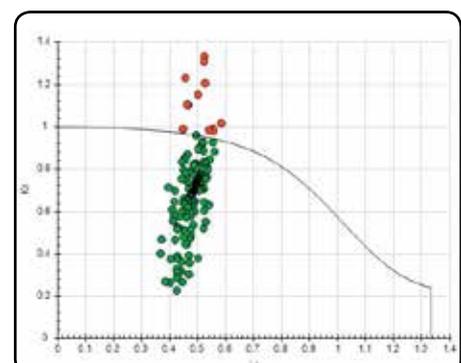
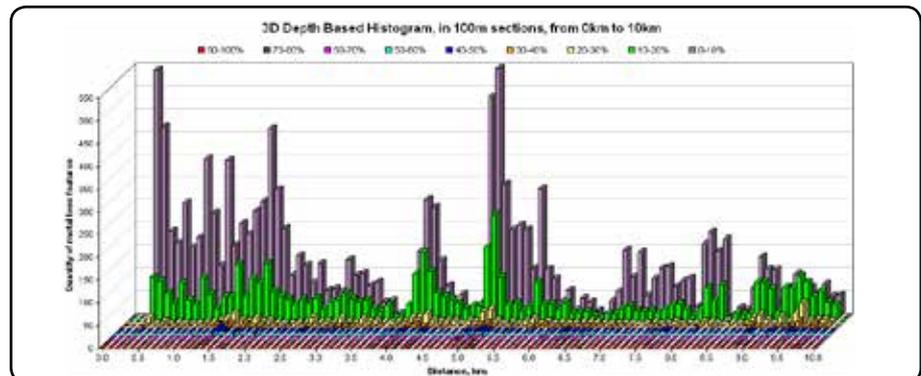
In FFP and FFS, the various detected defects by Pig is investigated for the safe operation of the pipeline and maintenance program is offered for each defect. By doing this assessments, it is possible to determine an integral maintenance program

for different defects by considering financial constraints.

In these evaluations, the ability to work in new conditions (working pressure) for operation of damaged pipeline or pipeline with a crack is determined for a specific time.

#### The assessment results:

- Dramatic increase in safety
- Reduction in direct maintenance cos
- Making recommendations for the safe operation of the pipeline till the next inspection time
- Determining any immediate repair
- Developing a timeline for future maintenance of the pipeline defects
- Recommendations to reduce corrosion and strategies to control
- Planning a timeline to apply an advanced corrosion management program
- Determining the life of defected pipeline





### Past Experience:

In recent years, Arkaline Company has been successful in dramatic increase of its market size by expanding different smart pig technologies. And in recent years, due to the high quality of services and satisfac-

tion of the employees, on average, more than 30% of market volume of contracts has increased. This year, Arkaline Company has a contract for Pigging of 8176 Km of oil and gas pipelines.



# **ARKALINE**

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**Office:**

Tel: +98(21) 8822 05 08  
Fax: +98 (21) 8822 0683

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**Work Shop:**

Tel: +98 (21) 6561 16 26  
+98 (21) 6561 16 27

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**Web:** [www.arkaline.co](http://www.arkaline.co)  
**Email:** [info@arkaline.co](mailto:info@arkaline.co)

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