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DIVULGA
CORROSIÓN E INTEGRIDAD

Evolution: ILI Tool of Integrity and Operational Trends

Injector prototype

Caliper prototype

First ITION field test.

The Corrosion Research Institute (Corporación para la Investigación de la Corrosión - CIC), fulfilling its mission to develop technology, takes up the challenge of improving In-Line Inspections with innovative engineered solutions, with easy implementation tools at competitive prices.

A strategic and technological hit in the development and testing of ILI tools was achieved in december 2014 during the first field validation process of the Magnetic Flux Leakage technique, performed on a TGI (Transportadora de Gas Internacional) gas pipeline in which the purpose was localize critical thickness losses in the metallic wall of the pipe.

Understanding the meaning of information given by smart pigs in analyzing the physical condition of a pipeline, empowered to meet requirements for local infrastructure and looking to support part of the corrosion management strategies of our clients, CIC started in Colombia the improvement of ILI technologies in 2001, developing pigs for Inspection of Integrity and Operational Trends (ITION for its acronym in Spanish).

CIC makes its first step with a project called “Program for the Internal Corrosion Management and Prototype of an Injector Pig for a Gas pipeline - CENTRAGAS S.C.A. 2002”, evaluated by COLCIENCIAS (Administrative department of science, technology and innovation) and co-finaciated by CENTRAGAS and SENA (National Service for Learning) within the framework of the Program for Strengthen Technological Development Institutes, in which was designed a prototype pig for Corrosion Inhibitors Injection.

In 2004 was developed a pig for measure operational conditions of a pipeline (pressure, flow rate, temperature and so on) and the first caliper prototype to measure the inside diameter of the pipeline, under the project “PIG Technologies for Internal Calibration and Operational Parameters Measurement on Pipelines” financed by COLCIENCIAS.
Continuing with the development and validation activities, in 2008 starts the contract “Development of ILI tool to detect pressure drops in pipelines”, leaded by the Colombian petroleum Institute - ICP and the national corporation of energy and petroleum - ECOPETROL.

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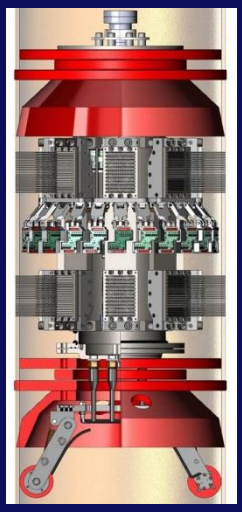

Tridimensional Visualization and MFL field test.

The pig developed gives measures of the operational parameters with the purpose of detect any inconsistency in the flow conditions.
This activity was the first pilot project using completely own CIC technologies, which traveled through a real pipeline segment.
It was able to reconstruct planimetry of a 40 kilometers and 12" diameter pipeline (with no derivations) and detect a representative transported fluid leakage. Since then and onwards this project was called ITION.

Late 2008 CIC propose the development of an instrumented vehicle with optical techniques for ICP, through a project called "Develop of a PIG for Detect Defects in the Inner Surface and Wall Perforations in ECOPETROL Pipelines, Based in Optical Principles".

During 2009, CIC empowered its designs for inertial measures supported by COLCIENCIAS under the framework of the "Strategic Management Program for the Integrated Corrosion Control in Oil and Gas Colombian Industry". ITION technology performed tests through different pipelines of co-financing companies as BP, OXY, TGI, ECOPETROL, and PROMIGAS, where diesel, jet fuel, gasoline, oil, gas and multiphase flow were transported.

ITION designs have multiple electronic and mechanical configurations that allows good performance in many different types of topography in Colombia. The technology is designed to withstand pressures up to 2600 psi in pipes with diameters from 8 inches and lengths up to 110 kilometers, with a battery life of 50 hours.

With this development and thanks to the co-financing of COLCIENCIAS and TGI, during the "Development of MFL Tool for ILI and Diagnosis of metal Thickness of Oil and Gas Pipelines, ITION-E", CIC exposes its capabilities to implement a high complex technology for the detection and localization of critical thickness losses in the pipe walls.

ITION-E certify today its capabilities of giving information by more than 260 sensors, inspecting the inner pipelines and accessories letting evaluate its mechanical integrity. Last ran validation approved that inertial signs registered all the dynamic testing conditions and the behavior of the new components confirms an excellent performance.

Results from ITION project are actually a CIC proud and evidence its capabilities to approach the state of the art on ILI development technologies, visualizing a promising future in which improvement and development of pigs, optimization of information processing, integration of technology sensors developed by international partners and the generation of strategies for marketing, constitute its major challenges.

Corporación para la Investigación de la Corrosión

ecopetrol TGI GRUPO ENERGÍA DE BOGOTÁ bp OXY