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Specialised Surveys: an exceptional tool for pipeline integrity

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Abstract

Since the 60^{ies}, specialised surveys have assumed a growing relevance for Oil & Gas Companies. Also for water pipes, specialised pipeline surveys have finally been recognised as a useful tool to verify their coating/metal conditions. Many important results have been obtained during the last 30 years by using various techniques. The present paper aims to point out which are the main important achievements in this field, their relevance towards pipeline integrity, their importance to manage correctly the integrity of pipelines. When pipelines can be inspected, the use of intelligent pigs is fundamental as they are able to detect internal and external corrosion and, by using specific technologies, to localise longitudinal and transverse cracks occurring in the metal of the pipe. When pipelines cannot be inspected by intelligent Pigs, and this, in some countries can be up to 40 to 50% of a whole gas network, specialised surveys are the only unavoidable means to approach the integrity of buried pipelines. The experiences gained until now show that specialised surveys can achieve, in the real field, some important results such as the following:

- Localisation of corrosions under disbonded coatings;
- Localisation of cracks due to Stress Corrosion Cracking;
- Remote detection of mechanical damages during pipeline lifetime (i.e. during their occurrence);
- Detection of d.c./a.c. corrosions;
- Characterisation in terms of average isolation value (or the Attenuation Rate when using the ECA method – The Electromagnetic Current Attenuation) of different pipelines or sections of pipelines according to their coating type (e.g. Bitumen, 2 Layers & 3 Layers PE coatings, Cold applied Tapes, thermo-shrinkable sleeves).

The results of real field experiences, sometimes strengthened by laboratory tests or field tests made by using laboratory devices, will be highlighted so that the new generation of engineers can take profit and keep on starting from this basic knowledge/achievements.

The use of a geo-positioning systems, such as LK2 GPSforPipe to precisely locate, trace and archive any particular point along a pipeline at the moment when the pipeline is buried, in connection with a GIS, will allow to have, from the very beginning, a clear picture of all points of interest especially those peculiar for the Integrity of Pipelines. This application also serves to pinpoint in a similar way the poles of public lightings, e.g. after examination from the corrosion point of view. Any specific spot will be pin-pointed on GIS Maps with annex photographs and relevant significant data (repairs, substitutions, special pieces etc.).