External Corrosion Direct Assessment (ECDA)

The In-Line Inspection is one of the most reliable tools to understand the integrity in a pipeline. However, sometime the Operator is not able to run this tool, due operational issues; the design is not compatible with this inspection technique or simply budgetary restriction. The ANSI/NACE SP502-2010 Standard Pipeline External Corrosion Direct Assessment Methodology gives us the guidelines to be able to investigate the condition of the pipeline, regarding external corrosion problem.

Our client wanted to know the current integrity status of an unpiggable pipeline. It is a buried pipeline with a final section above ground for connecting with the client facilities. Its product was dry gas, thus the internal corrosion is not an issue. The ECDA methodology was the most suitable to assess the pipeline integrity review.

ECDA includes the following four steps:

- **Preassessment**: collects historic and current data to determine whether ECDA is feasible, defines ECDA regions, and select indirect inspection tools.
- **Indirect Inspection**: this step covers aboveground inspections to identify and defines the severity of coating faults, other anomalies, and areas where corrosion activity may have occurred or may be occurring. Two or more indirect inspection tools are used.
- **Direct Examination**: includes analyses of indirect inspection data to select sites for excavations and pipe surface evaluations. The data from the direct examinations are combined with prior data to identify and assess the effect of external corrosion on the pipeline. In addition, evaluation of pipeline coating performance, corrosion defect repairs, and mitigation of corrosion protection faults are included in this step.
- **Postassessment**: the last step covers analyses of data collected from the previous three steps to assess the effectiveness of the ECDA process and determine reassessment intervals.

Next figure shows the different ECDA areas to this pipeline:
Procainsa SA has a great experience in coating inspection (DCVG / ACVG techniques), cathodic protection, CIPS and soil surveys: resistivity and pH.

The inspection methods, depending on the areas previously identified, are shown in this table. The inspection data and the evaluation of this, help us to identify the defect for investigation.

<table>
<thead>
<tr>
<th>Zone 1</th>
<th>DCVG + CIPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 2</td>
<td>DCVG + CIPS</td>
</tr>
<tr>
<td>Zone 3</td>
<td>DCVG + CIPS + PCM</td>
</tr>
<tr>
<td>Zone 4</td>
<td>Visual Insp. + NDT</td>
</tr>
</tbody>
</table>

Inspection Techniques

The graphic below shows the inspection data in the major feature:

Una vez identificado el defecto, se procedió a la inspección directa la cual mostró un área con problemas de corrosión externa como muestra la siguiente fotografía.

And finally, the direct inspection finds one external metal loss as show the next photos.

The ECDA procedure provides a reliable methodology for investigating the pipeline integrity from external corrosion point of view. Similar procedures exist for internal corrosion and Stress Corrosion Cracking.

In many cases the Operator has all the inspection data and only need to study jointly the full data.

Pipeline Integrity Team Lead - "Procainsa SA studied the existing data and carried out new inspections. They helped us to discover this external corrosion feature, on a critical pipeline from supply quality point of view."