



Reinhart
Hydrocleaning SA



Differences between HMC and Pigging



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Introduction

In 1952, A.J. Reinhart developed the Reinhart Cleaning Technology (**RCT**).

This technology is a tailored Hydro Mechanical Cleaning (**HMC**) process.

Over the years, **RCT** improved and matured.

In 1996, **RCT** was used offshore the first time in the Beatrice oil field on the North East Coast of Scotland.

After this historical step, **RCT** developed differently compared to the standard pigging procedure. Comparing **RCT** to Pigging is like comparing “apples to oranges”.

The aim of both techniques is to clean pipelines, but both methods are totally different.

In this documentation, the three big differences between **HMC** and Pigging will be explained.

Quality

The cleaning quality is determined by the efficiency of the cleaning tools.

With the experience gained over the years and the results of the ILI runs after **HMC**, it is proven that our cleaning efficiency begins where pigs reached their limits.

Pigging - Standard solution

The pigging industry proposes standard solutions called pigs.

Those pigs are adapted to the diameter of the pipeline and the deposit that has to be removed. Pigs can be ordered in a catalog regarding the dimension of the pipeline.

Over the years many **RCT** “standard” principles found their way on pigs like:

- V-Blades on arms

- Cleaning-Scrapers
- Cleaning-Springs
- Twin Springs

Differently from the **RCT**, which provides an adapted and optimized cleaning tool for a quality cleaning solution, these “standard” dimensioning pigs (size and force) provide a limited cleaning quality.

RCT - Tailor made solution

RHC SA proposes a tailored cleaning solution to



16" dewaxing MCT receiving

each client.

According to pipeline configuration as:

- Internal diameters
- Minimal bend sizes
- Deposits to remove
- Pipeline materials
- Cleaning medium
- Flow capacity
- Launcher and Receiver lengths
- T-pieces, Y- pieces, Cross-pieces or other special parts.
- Penetrations
- Pigging history
- Etc.

The cleaning elements are adapted to the whole pipeline configuration in order to maximize the



To clean or not to clean?

cleaning efficiency.

A tailored cleaning tool will guarantee an optimized cleaning with a quality result.

Principle

The principle of cleaning is in both techniques based on pushing a cleaning element through the pipeline using the operating medium. The significant difference of the two techniques is the usage of the operating medium.

Pigging - Static cleaning

The cleaning of a pipeline with a pig is static.

This means that the pig propulsion discs/cups are sealed, i.e. the tool advances at the same velocity as the fluid.

The propulsion discs are sealed which leads to the conclusion that there is:

- No flush effect
- No transportation of the removed deposit

RCT - Dynamic cleaning

The cleaning of a pipeline with RCT is dynamic.

This means that with an adapted bypass, i.e. the tool advances slower than the fluid.

A bypass induces:

- A flushing effect that transports the removed scale in front of the Hydro Mechanical Cleaning Tool (HMCT)
- A cleaning effect directly on the pipe wall with the produced jets. The jets can reach a velocity up to 60 m/s.

Costs



36" descaling MCT

The financial aspect of a project is not negligible. Comparing the different cost points without a global vision is a fatal mistake.

A tailored tool is significantly more expensive than a pig. This cost difference is reflected in the used principle and quality of the RCT.

Project related, the financial schemas are totally different.



36" descaling MCT

Pigging - Exponential costs

Using pigs can be a solution in most of the cleaning configurations. The cleaning quality with the usage of pigs regarding dewaxing, descaling or cleaning prior inspection will never be equal to a dynamic HMC.

The low pig costs are quickly overhauled by operating costs.

During dewaxing or descaling campaigns, 30 to 50 pig runs or more are common and not surprising.

Mobilizing people offshore for a non-defined number of cleaning runs explodes:

- The duration of the campaign
- Stand-by costs for inspection material
- Daily rates for professionals
- Daily rates for material (ships, pumps, ROV's, etc.)
- and therefore the budget of the campaign.
- Running pigs on a maintenance basis is not a factor to
- guarantee successful cleaning campaigns.

RCT - Controlled costs

Based on the experience acquired over the years, RHC SA is able to provide a cleaning proceed to guarantee a quality cleaning solution.

The investment in designing and machining HMC cleaning tools:

- Shortens the number of cleaning runs
- Provides a quality cleaning
- Provides a quality inspection
- Reduces total amount of daily rates for professionals and material
- Avoids stand-by costs for inspection tools

RHC SA cleaning tools are project dedicated. No stand-by or reactivation costs are charged to the client.

Dewaxing explained by „The RHC Cartoon Crew“

Who are they?

Testing multiple ways to explain the “Hydro Mechanical Cleaning” concept, RHC SA has decided to go a different and less common way. Using cartoons to define the various components of the HMC should help people to understand. It is easier to understand the concept simply with a smile than trying to do it by digging into details.



„Reini“ the Fox

Reini symbolizes the RHC SA company. With wisdom and cleverness he improves the HMC technology to face the challenges of the market.



„Rudi“ the Sheep

Rudi symbolizes the HMC tools as they are seen by the market. Like a black sheep, RHC SA's way of cleaning pipelines as well as the result differ from the standard.

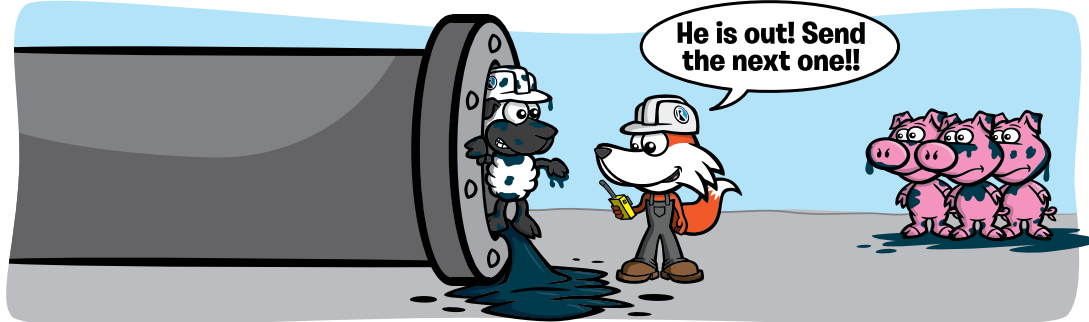


„Abby“ the Tiger

Abby symbolizes the famous Tiger-tool. She cleans the pipe-wall with her claws in order to optimize the inspection and to prevent corrosion

Cleaning Runs

In addition to maintenance pigging, RHC SA runs adapted cleaning run sequences. Experiences have shown that pigs are not able to remove the wax out of the pipeline but smear it against the pipewall. As a result, wax layers occur.



Tailored cleaning Tools

The age of the wax deposit influences the hardness. RHC SA provides tailored tools to remove the different types of deposits. Compared to manufactured pigs with standard sizes, RHC SA adapts each mechanical cleaning tool to the pipeline specifications.



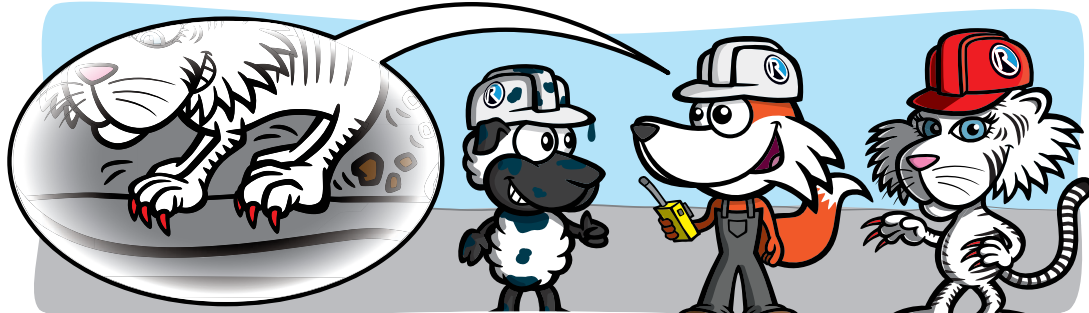
Mechanical Cleaning

Mechanical cleaning implies adapted cleaning forces and cleaning angles. Whenever a brush would slide, RHC SA springs will scrape the wax off. In order to clean channel or pit corrosion, the spring digs into the corrosion to pull out the deposit.



Experience and Quality

Over the years, the RHC SA “Tiger Tools” made their reputation in the North Sea and onshore in Europe. The principle has been copied in the pigging industry but nothing is comparable to a tailored solution. The cleaning angle, force, amount of springs, etc. make the difference.



Since 1952
Thinking out of the box
...still not in it!



Tailored cleaning solutions

Made in Switzerland



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