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CONTRIBUTIONS ON TECHNOLOGICAL PROCESSES CLEANING OIL PIPELINES

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Abstract: *In this paper the researches are presented concerning the technological processes of oil pipelines. We know several technologies and materials used for cleaning the sludge deposits, iron and manganese oxides, dross, stone, etc. de on the inner walls of drinking water pipes or industries. For the oil industry, methods of removal of waste materials and waste pipes and liquid and gas transport networks are operations known long, tedious and expensive.*

The main methods and associated problems can be summarized as follows: 1) Blowing with compressed air. 2) manual or mechanical brushing, sanding with water or dry. 3) Wash with water jet of high pressure, solvent or chemical solution to remove the stone and hard deposits. 4) The combined methods of cleaning machines that use water jets, cutters, chains, rotary heads cutters, etc.

Keywords: *pipe, rehabilitated, hydro*

1. INTRODUCTION

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The main methods and associated problems can be summarized as follows:

- 1) Blowing with compressed air.
- 2) manual or mechanical brushing, sanding with water or dry.
- 3) Wash with water jet of high pressure, solvent or chemical solution to remove the stone and hard deposits.
- 4) The combined methods of cleaning machines that use water jets, cutters, chains, rotary heads cutters, etc.

Their disadvantages are their ineffectiveness in some cases and in other cases that are costly, laborious and requires equipment, expensive specialized tools and skilled personnel

In method 1) a large proportion of deposits still remains adhered to the pipe wall and must be used, still one of the methods 2), 3) or 4). Many times, the pipes must be removed in order to achieve this, involving many hours of work and a substantial loss of production time. Procedure 2) requires removal of deposits of rock, smelting slag, sludge etc using manual or mechanical methods drive heat engines or electrical, are consuming and expensive. Same inconvenience them and methods 3) and 4). In addition, the methods which use water, solvents and chemicals, because of mixing of waste with water, solvents, or chemicals, rezidurile deployed in the pipes are diluted after use and, subsequently, are the subject of unloading in rivers, sewers or drainage systems.

2.THE PODS OF POLYURETHANE FOAM

Methods for removing disadvantages which are known and in the first row of high cost of equipment, tools and materials used, has created new methods and technologies among which stands out for its costs down and secure small , cleaning technology which uses flexible capsules which is a rapid method, Simple and effective cleaning drinking water pipes, clean water for industry or sewage, pipeline equipment, pipes and tubing in oil industry and extraction, etc. . Industries and producers who have made a small investment, through the use of foam rubber dishes.

In most cases are not necessary cuts and excavations or they are kept to a minimum, the pods of polyurethane foam can I clean long distances of pipes or tubing in a single pass, Without the need for numerous operations, or other systems for cleaning (see case study pipe cleaning 10 kilometers length and diameter 150 mm).

Foam capsules can I clean lines of pipes and pipes, moving with speeds of up to 3 meters per second.

3.CLEAN LINES AND TRANSMISSION NETWORKS CRUDE OIL AND PETROLEUM PRODUCTS AND REMOVING PARAFFINS ARE TOCEREZINEI, ETC. IN THE PIPES WITH MATERIAL NANOTEHNOLOGIC BIOFLUID SC

It is used for unplugging pipes and for maintaining them still clean, new material nanotechnology Biofluid SC with multiple uses in mining industry and processing of the crude oil, including cleaning pipes. In applications of the pipes, a simple battery separation from the point Terminus of the pipe similar to a process to separate salt water at the mouth probe will be the simplest method of separation of petroleum products cleaned of CHANGE SC is injected into the pipe, either by a centrifugal pump or pump mag with a flow meter. SC will be mixed and mixed during transit through the pipe. As a rule the initial calculation , formula for the application is 1 gallon (3,785 liters) of SC concentrated at 2,973 barrels of crude oil (472 liters)which runs through a pipe obstructed.

When SC is used to clean the wax build-up in the pipes, it is injected into the flow of crude oil at the end piece of the pipe by means of a centrifugal pump or pump mag. SC in the solution must be in the ratio of 6:1 AM water to CHANGE This report of the solution is applied and when it is used for any application for internal cleaning.

The pipe ecuadoriana of crude oil is a classic from this point of view : crude oil Ecuadorian is very difficult, and sulfurous acid, with much wax. It is extracted from a high altitude and, transmission line sloped down and climbed mountains reliful Anzi. This situation causes an increase in the crude oil viscosity, already thick, resulting in costs of pumping extremely high.

4. PIPE CLEANING MIXTURE WITH AIR-WATER UNDER PRESSURE

By this method shall ensure eliminating unnatural smell and taste of drinking water. Pipe cleaning method ensures the deposits of iron oxide, manganese, mud, sand and other types of sediment. Pipes are rinsed in a simple, efficient and with immediate results.

Figure 1 shows some examples of rust the pipes :



Figure 1:Examples of rust the pipes

Cleaning mixture with air-water under constant pressure, does not produce any danger on the appearance cracks or rupture in pipes. Isolate section of the pipe to be cleaned from the rest of the system. Using the computer is

determined quantities of air and water needed to run an effective cleaning from section of the pipe. The mixture air-water creates shocks (as mixture speed may be up to 25 m/s) to facilitate effective cleaning unwanted deposits on the tailpipe. They are discharged once with water.

Advantages of the method are:

- simple, effective method;
- ensure improvement of the functioning hydrants;
- provides a cost/quality;
- eliminates pipe plugs from the inside;
- ensure increase in flow of water transported to the pipe ;
- prevents the occurrence of deposits hard floors, Which cannot be disposed of without effort and additional costs by this method;
- savings on maintenance costs and efficient exploitation of the pumps

5. PIPE CLEANING METHOD - THE CAPSULE POLLY PIG SLUDGE , IRON, MANGANESE, SEDIMENTS OR OTHER STORES COUNTRIES .

The capsule Polly Pigs offers a rapid method easy and cost of cleaning and restoring of the water network. The pods in Polly Pigs are available in several forms and consistent to meet even the toughest challenges. And I'm also available in all sizes common to 10 mm up to 2000 mm.in figure 2.

In Figure 2. It shows the capsule Polly Pigs .



Figure 2:The capsule Polly Pigs

- For cleaning uses a capsule with max. 5% Larger than the diameter tube. The capsule moves along coolant pipe due to the pressure.
- Severe changes direction (Elbow to 90 degrees or TEU) , does not prevent diaphragm movement. Long sections of the pipes are cleaned effectively by the repeated operation.

In Figure 3.shall be presented the pipe before and after cleaning with the capsule in Polly Pigs

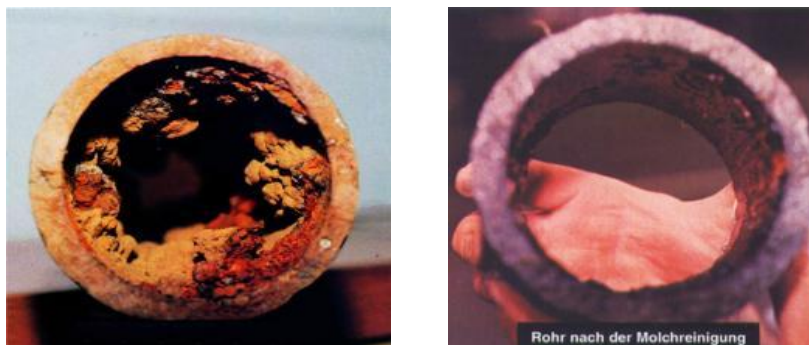


Figure 3:The pipe before and after cleaning with the capsule Polly Pigs

Cleaning speed must not exceed 0.5 - 1.0 m/s.

In Figure 4 shows cleaning with the capsule in Polly Pigs pipeline network with elbows.

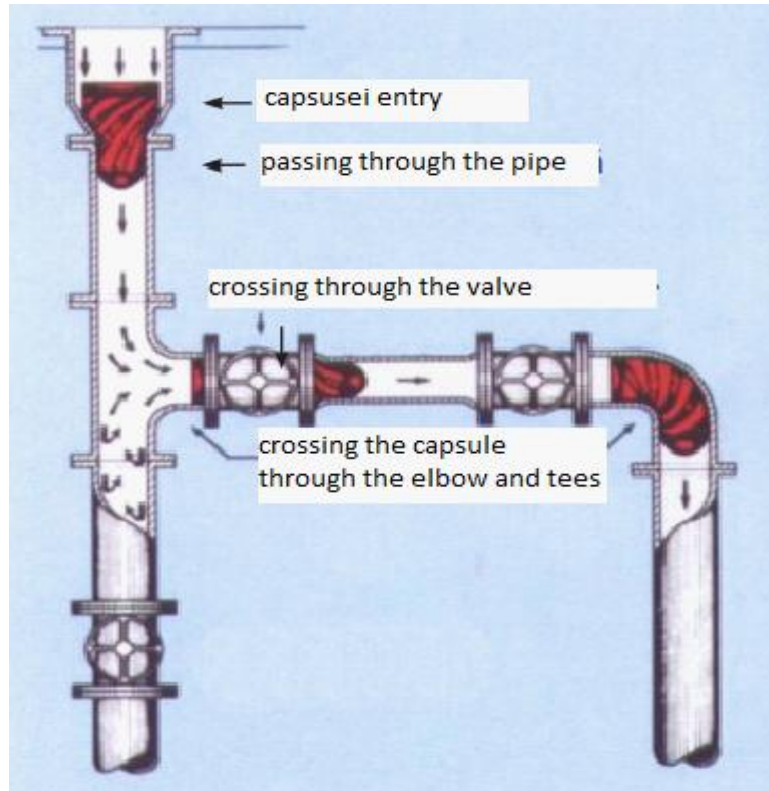


Figure 4:Cleaning with the capsule in Polly Pigs pipeline network with elbows

6. PIPE CLEANING USING ROBOTS

This method is used under supervision with your TV for removal of deposits strengthened and barriers that obstruct cross-section of the pipe. In order to ensure that they do not jeopardise operations condition of the pipe, they will be running centered and robots are equipped with adjustable trimming heads stepless. In Figure 5. pipe cleaning is presented with the help of robots



Figure 5:Pipe cleaning with the help of robots

To carry out cleaning must be carried out:

- preparatory work;
- pressure washing high heating pipe and district heating for removal of deposits neantarite;
- Bypassing the section you feel revitalised by a provisional pipe is only necessary to increase the amount of water;
- visiting pipe with TV camera;

Browse TV camera with the pipe shall constitute the document for the establishment of status pipe concerned in order to locate obstacles and to verify the effectiveness cleansing.

Main part of the system with robots is an implement carrier which is fitted with end pieces of drilling and trimming. All work is carried out by remote control and are supervised by a room TV. The operating range of the robot is approximately 100 m.

With a view to robot guidance and centring in the channel are made available different sets of wheels montabile, according to the nominal diameter of the canal. The thing is mobile in all directions and may be rotated 360° to the longitudinal axis. The trimming work can be carried out on the basis of the nature damage with various tools in terms of maintaining a partial flow in the channel. For revitalising unions, which are pozate withdrawn by more than 5 cm, use an implement to revive for the unions. In all cases of repairs in order to obtain an optimal adherent within systems of revitalization in question for the application of the layers must be removed pieces detached by trimming or washing at high pressure. The work will be carried out under the supervision TV camera with pipe, permanently on video tapes.

7. CLEANING PIPES WITH ICE CARBON (CARBON DIOXIDE)

Buffer against chipping ice with carbon is a new process of cleaning which uses carbon dioxide in solid form of granules. The carbon dioxide in the solid state is also known as ice carbon or dry ice. Method of Shot blasting, cleaning, and decontamination of ice dry ice has grown considerably in popularity by replacing more and more classical processes mainly due to the productivity (results obtained more quickly), and the non-destructive examination and environmentally friendly technology. In Figure 6. shall be submitted cleaning carbon ice pipes

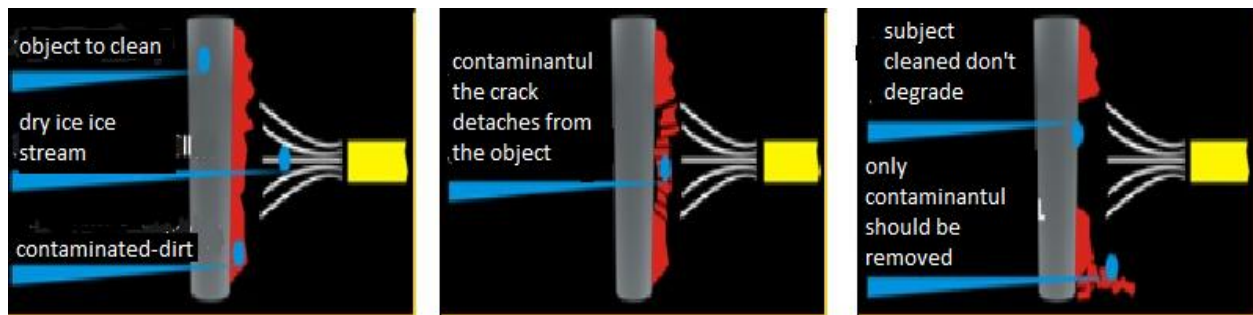


Figure 6: Pipe cleaning carbon ice

Under the conditions of rules for the protection of the environment more and more severe and the need for cost reduction, the industry has found in this method the best way to eliminate losses. The process is based on physico-chemical characteristics of ice carbonic: low temperature of -79 degrees Celsius, dye sublimation from solid to gas volume expansion with extremely long (approx. 700 TIMES). During chipping, ice dry ice is converted into particles extremely small which are designed with Supersonic speed of that object to be cleaned. Particles are accelerated using compressed air as well as in the case chipping classic.

That methods of shot blasting, (cleaning or decontamination with dry ice) are absolutely non aggressive and corrosion free, ahead of start all traditional methods known. Thus, while cleaning with water or steam, regardless of pressure and temperature, is questionable results, the one with sand, oxides or salts proves most of the times too aggressive leading to qualitative or dimensional changes the surface of the pipe to be cleaned. Most traditional methods have special restrictions of use and are hazardous to health to those who handle them. In the case of use solvents and cleaning solutions, they become contaminated residues at the end process requiring additional operations for recycling.

We distinguish three steps within the framework of this specific procesde cleaning :

Transfer of energy - particles are designed from gun Shot blasting with Supersonic speed coming into collision with object area to be cleaned. Transfer of energy performs a cleaning of this surface without abrasion, impact is the first step in the process of cleaning.

Thermal shock - temperature extremely low carbon particles hitting the ice contaminated surface creates a thermal shock to the impact surface that generates microfisuri into the layer of contamination.

Pressure of the gas expansion result in positive displacement - in the final stage of the process, the particles explode at the impact surface, by heating them in the change to its gaseous state widening and the volume of up to 700 times!

The result achieved by spraying with ice dry ice depends on:

- the spraying pressure;
- gun nozzle spray (available in a wide range of forms);

- agent characteristics of contamination to be removed;
- the material , temperature and hardness of the surface of substrate ;

8. CONCLUSIONS

Using these methods of cleaning note the following advantages :

fast and affordable

machines do not need to be removed to be cleaned. Cleaning is carried out without the machine to be disassembled, reducing production goals, and, in some cases the operation making it even without stopping the machine.

Methods, which are abrasive

Particulate of dry ice are not heavier than gypsum and changes in the gas as soon as hitting surface. Compared with conventional spray environments, dry ice does not cause wear of undercoat. In the process of cleaning with dry ice, the spraying pressure can be adjusted at a pressure between 2 ... 16 bar, thus gearing aggressiveness process at individual needs of a specific business cleaning.

Environmentally friendly methods

Ice carbon balance can be a substitute solvents excellent corrosive and aggressive, with no harmful emissions. Since this process of cleaning do not use the water, the vast majority of treatment measures it become outdated. Sticky dirt and elastic is removed quickly and easily without leaving residue of a cleaning agent, eliminating additional steps and costs of escape.

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