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Case Study - Petroleum Production Scale in the Recycled Water Line

Updated on: June 30, 2014

Customer: Natural gas and oil producer in Nikiski, Alaska, USA.

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Water conditioning device: *Hydro*FLOW 120i.

Application: Offshore petroleum production operation. The device was installed on a 4.5" outer diameter recycled water pipe, after the separator.

Goal of product evaluation: Reduce scale accumulation inside the pipe and possibly soften existing scale deposits. The scale is predominantly made up of iron. In addition, lab analysis of the scale detected small quantities of magnesium, calcium carbonate and silicon.

Installation date: October 17, 2013.

First inspection: October 23, 2013 (*Hydro*FLOW on for one week).

Second inspection: November 18, 2013 (*Hydro*FLOW on for one month).

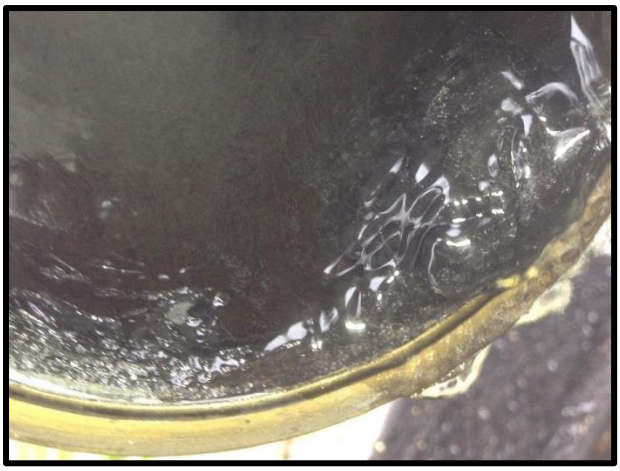
Third inspection: December 30, 2013 (*Hydro*FLOW on for two months).

Final inspection (if necessary): Scheduled for June 2014 (*Hydro*FLOW on for seven months).

October 17, 2013 - Installed *Hydro*FLOW 120i

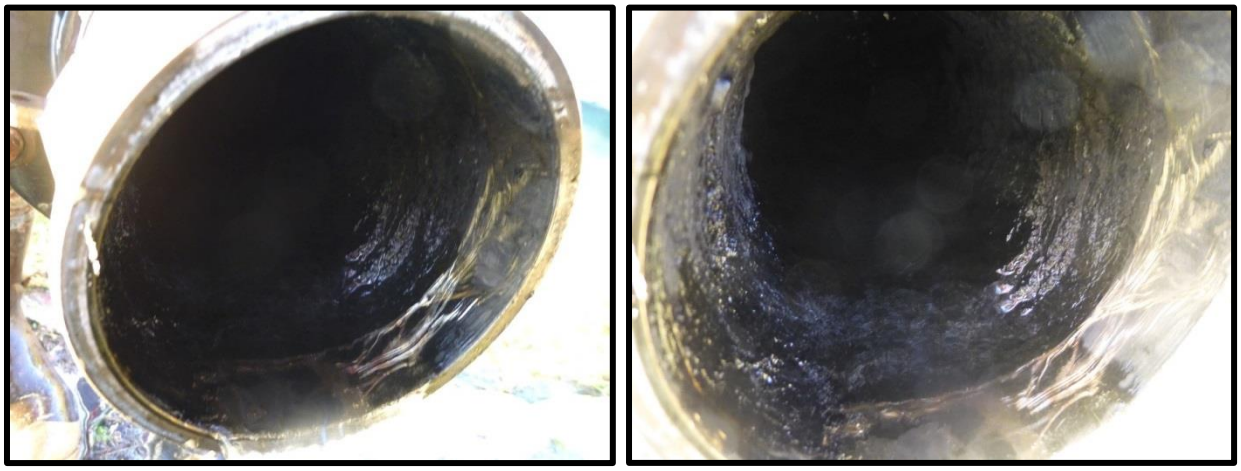
December 30, 2013 - Installed *Hydro*FLOW 120i with winter protection (0° F / -18° C)

Installation - October 17, 2013



Baseline - Hard scale of roughly 1/2” along the inside of the pipe. The scale is dark because it is a mix of iron (predominantly), magnesium, calcium carbonate, silicon and other minerals.

First inspection - October 23, 2013



One week after the *Hydro*FLOW 120i was installed - The scale was much softer and easily removed with a knife. A ring was cleaned in order to determine if scale will not accumulate on a clean surface as long as the 120i is in operation.

Second inspection - November 18, 2013

One month after the *Hydro*FLOW 120i was installed - Apart for what seems like a thin magnetite layer, hard scale is not accumulating on the area that was cleaned after the first inspection. Existing scale can be flaked off with a finger and is roughly 1/8" to 1/4" thick. The customer's personnel were very surprised because typically removal of scale involves hard manual labor.

Third inspection - December 30, 2013


Two months after the *Hydro*FLOW 120i was installed - Hard scale is not accumulating on the area that was cleaned after the first inspection. Existing scale can be easily flaked off.

Third inspection - Additional observation


A "T" section was removed from the main line in order to inspect the inside of the pipe. It was noticed that the rate of scale removal from the bottom was much faster than the top and sides. The reason for this is because the bottom of the pipe has constant flow of water which allows scale to be removed more efficiently.

Final inspection

A Final inspection was supposed to be conducted 7 months following the installation of the *Hydro*FLOW 120i water conditioner. Conducting a final inspection was not required because there was no drop in water flow due to *Hydro*FLOW's ability to keep the pipe free of scale accumulation.