

https://dspace.org/

Optimizing flow assurance using pigging in sub-sea pipelines

De Wit, Derek

2016-03-15
http://hdl.handle.net/10539/20085

Downloaded from a DSpace repository. https://dspace.org/

ABSTRACT

One of the most used techniques for control of wax deposition within subsea pipelines is pigging. The method simply scraps the wax away from the pipe wall using a pig as part of the process. A pig is pushed forward with the natural pressure of the fluid from the reservoir into the pig launching station that is situated at the end reservoir. The force that the pressure creates will force the pig to straight through the transportation pipeline to the pig receiving station where the pig will then get trapped and removed from the pipeline. Pigs are designed with discs and brushes to scrap off all the wax that has precipitated to the inside of the pipe wall. The pig will have bypass holes to allow the scraped off waxes to flow past the pig and dissolve back into the fluid and or stay in front of the pig and will then be drained at the pig receiver to get rid of the build up waxes on the inside of the pipeline. It is therefore critical to find the right pigging frequency by doing calculations in order to reduce the costs and avoid flow problems as the wax layer buildup causes the bulk viscosity of the oil to increase sharply and lead to high pressure losses within the pipelines. Calculations are done taking all the variables into consideration to plot a graph to evaluate the optimum frequency to launch a pig. It is also known that it is almost impossible to launce the pig at its optimum frequency due to production, maintenance etc requirements. This makes it very important to study the frequency graph and to select the best suitable alternative time to launch a pig without wasting money launching the pig to frequent or to ensure that the pig doesn't get launched too late which will end up getting stuck inside the pipe.

This thesis has investigated some of the key criteria to consider when finding the **optimal** pigging frequency strategy such as what is the optimum pigging frequency point, launching a pig to frequent and launching a pig too late it also indicates what should be considered when it's not possible to launch a pig at its optimum frequency point, describing different pigging regions advantages and disadvantages. Some of the advantages will be wax free pipelines, pigs won't get stuck inside of the pipeline, more oil production and some of the disadvantaged will be launching the pig too late means that the pig might get stuck inside the pipeline, loss of production and possible abandonment of an oil well which is very costly.