

# Pigs Unlimited International, Inc.

## Pigging Sand Buildup

There are three ways to best pig lines where sand is present. The best method will depend on the amount of sand, how it is deposited through the line, and the volume of the propellant available for pigging.

The first method consists of using only light density swabs. This method is effective but very time consuming. Even though swabs bypass to help keep the sand in suspension, they are not strong enough to push a large amount of suspended particles through the entire line per each pig run. Therefore, a large amount of pig runs are needed to remove the sand. This method is good for applications where increased pigging volumes are not available. On the other hand, if the propelling medium contains sand, this method is not the best choice because for the little sand that is removed by each swab run, the propelling medium may be depositing the same amount of sand on each run, or more.

The second method involves using foam or steel pigs with bypass jets. Most standard steel pigs are equipped with this device. It usually consists of a threaded pipe plug connection. For foam pigs however, a design change is needed. Normally, tubes are used in the manufacturing process to provide a path through the entire length of the pig. The sizes and quantity of bypass jets needed depends on the application. The bypass jets allow the propelling medium (preferably a liquid) to bypass the pig. And because the bypass jets are small, the bypass is sent in front of the pig at a high velocity, therefore causing a tremendous turbulent flow keeping the sand in front of the pig in a state of suspension. This aids the process greatly by allowing the bypass to agitate the sand, therefore allowing the pig to displace it. The only minor drawback on this method is that due to the bypass jets, the pig's speed is reduced as much as 30%. In applications where adequate volume is not available to propel a pig with bypass jets, this method should not be used. The reason for this is because the pig may not launch or worse yet may become stuck further down the line. Another application that this method should not be used is where, extreme deposits of 30% or more of sand exist. The bypass jets cannot agitate and keep suspended this, much sand. Therefore the pig has to try to negotiate over the unaffected buildup. With this much sand, the pig may become stuck.

This leads us to the third method. It requires common foam pigs and extreme high-volume propelling medium (preferably a liquid). We begin with a pig whose diameter is equal to the internal pipe diameter, less the largest amount of deposited sand per a cross-sectional view. For example, if we were pigging a 24" pipeline with a buildup of sand of 8", we would subtract 8" from 24" and use a 16" foam pig. To picture this, imagine a circle and draw a horizontal line approximately two-thirds from the top. Then draw a circle within the space from the top of the first circle to the top of the horizontal line. The first circle is the pipe; the horizontal line is the sedimentary buildup; and the second smaller circle is the pig. The area on each side of the pig is empty space in the pipe, which the propelling medium is going to bypass. This is what is going to cause the turbulence to agitate the sand and keep it in suspension. This is why so much volume is needed -in order to propel the pig with such a large amount of bypass. The diameter of the pig is increased for subsequent runs until reaching the nominal internal diameter of the pipe.

By knowing the conditions of the pipe, the desired pigging results, and the capacities of the equipment being used, pigging can prove to be the most cost effective and best method for cleaning the pipe.

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