



## Holy Rip!

Or where did my returns go?

**H**oly rip, where did my drilling fluids go? “Holy rip” was a term my late father used, and it meant that something went terribly wrong. When a driller calls to get the fix for his lost circulation problem, it usually is in combination with other four letter words that do not include “holy.” Sometimes the driller wants a quick fix and a guarantee when we recommend a product. The only things I can guarantee is that we know less about the borehole and formation than you do when you call. So asking someone how to plug it is fine, but asking for a guarantee that it will work – well, you won’t get that. It is really as simple as this little exercise. Have your wife blindfold you and stand you in front of a window. Have her open it to different heights, and then you have to guess the size of the opening. Get the answer wrong, and she gets to Taser you. My guess is you will not play this on your next family game night.

You and I cannot be certain, because the most valuable information we can have is how big the void or crevice is that the fluids are flushing through. This is 99.9 percent always an unknown. Short of getting a camera down-hole or knowledge from other boreholes in the area, there really is no way of knowing. I have heard many ways of stopping fluid loss – some legal and some questionable. Let’s look at one way to attack the problem, understanding that this is not the only way to fix the problem. Your conscience and your state laws should be your on-the-job guide. My co-worker, George Dugan, likes to state, “The faster you lose it – the harder it is to get back.”

Plugging or bridging will be the easiest way to solve the problem, but is best performed on smaller crevices, cracks and some voids. All bentonite companies make and market lost circulation material (LCM). LCMs are meant to be used to stop the most costly losses – those being the unexpected. An unexpected loss



There are some factors to keep in mind when choosing lost circulation material. Photo courtesy of Schroeder Rotary Drilling and Pump Co.

means downtime, and this lost time (manpower and equipment) can be many times more expensive than the products that may get you back into production drilling.

These blended LCM mixes have the proper particle size(s) for maximum plugging, and are the most effective loss circulation materials available. Just like there are different drilling fluids for different drilling conditions, there are different LCM products to meet varying formations. The proper LCM product, depending on the size of the exit wound, can help you quickly regain circulation.

These commercial products contain many products found in nature. Many materials are the same as your father and grandfather used like flake material (cellophane), a granular material (found in nut shells), fine fibrous material, and coarse fibers (like cedar fibers). Others are specially formulated spun long and flexible mineral fibers

that will give increased circulation by bridging and plugging off voids, fractures and all types of permeable formations. The interlocking nature of these special fibers will provide a framework for forming a low permeable mud cake; this will produce a reduction in drilling fluid loss and hole-caving in a perfect world.

A few things to consider when choosing an LCM:

- That it contains no fermenting materials or materials that chemically change the rheological properties of the drilling fluid (drilling fluid being the total mix, including polymers).
- The ingredients must be compatible with all oil- and water-based muds (depending on your industry).
- That it is non-corrosive to your drilling equipment.
- Can you pump it – what are the mixing requirements?

If you are developing the well, and will be using a screen for water pro-

duction, remediation or testing, it is important to have an LCM product that is acid-soluble. The LCM cannot tell the difference between a formation crack and a screen slot. It has one job – seal the space, and it will. A little planning before pumping just any LCM into the hole can save you money here.

There also are granular types of advanced LCMs that use super-absorbent materials. These products rapidly absorb and retain large volumes of water. Depending on the product, some will absorb up to 300 times their weight in freshwater, while expanding less than 5 percent in total volume. A bit more costly than their natural cousins, these super-absorbent materials seal large and fine fractures, and work well in highly permeable and porous formations. This type of LCM usually can be added directly into drilling fluid, and will not harm the pumping equipment. Because this type of LCM works well in large and fine fractures, it would be my choice of an emergency stock item for the support truck.

You also can mix different types of LCM products to match to your problem. No matter what products you are using, follow the instructions on the technical data sheet (TDS) for mixing and application. Understand that LCM products will not always solve your particular problem, and be prepared to take additional actions.

One last thought about LCM products: From my distribution days, I know that distributors like to see turns on products – that is, products that sell and are reordered regularly. Because of the nature of LCM products and their emergency-type use – they are not used day-in and day-out, and therefore do not get stocked by all distributors. It really is a good idea for you, the drilling contractor, to stock some LCM products for your next unexpected problem.

Happy holidays to all! **ND**

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