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SOLUTION MINING DEDICATED CUTTER
I. INTRODUCTION

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Abstract

Developing underground brine cavities requires hanging casing strings. In order to optimize their shape and size, these strings have to be run at positions in accordance with Solution Mining methods.

The pipes may bend, break or collapse due to vibrations, falling of insoluble rocks, or any unexpected down-hole conditions, as it may also be stuck in the sump. In any case, the optimization of cavity development would not be ensured anymore.

In these conditions, to be able to go on with proper cavity development, the pipes must be removed or cut. In order to conduct these operations, several methods have already been designed and validated. The choice among these is generally made upon price, availability, safety, environmental considerations and physical constraints including the size of the tubing, the depth of the cut, casing conditions and requirements about the cleanliness of the cut.

The existing methods are based on 3 main technologies:

- Explosive charges, chemical products;
- Mechanical blades;
- Abrasive methods.

The mentioned methods have advantages and drawbacks regarding availability of the equipment, percentage of success of the cut, time costs when the cavity is on stand-by, and ability to run logging instruments below the cut.

The new “EZ Casing Cutter”, at the current development state, is able to cut any pipe with diameters ranging from 4’’ to 8-5/8”, provided the fluid inside the pipe to be cut is conductive; smaller (ID 3” to 4”) and higher (ID 9” to 13-3/8”) diameters are in progress.

This innovative system has already been successful in brine production fields and in deep hydrocarbon (HC) storage cavities. It initiates a very precisely located groove on the inside side of the pipe that builds up until it gets through enough to force the lower end of the pipe to drop.

This new system presents many advantages, amongst which it is important to highlight the following:

- Quality of the cut: perfect and sharp cut, with no crack, fissure, or deformation on the remaining pipe;
- Smart cost: cutting a pipe with EZ Cutter does not need a rig-mobilization and can be included in a survey campaign;
- Lightweight: Only a standard logging unit is needed;
- Fast: the time to cut is a function of the diameter and the thickness of the pipe (i.e. 3,5 h for a standard 7” pipe);
- Safety: No vibrations, no explosion, no chemical or dangerous products, no damage to external pipe.

This technical paper will describe in detail – supported by several identified cases – why the “EZ Cutter” system should find a place within the number of existing methods.

Key words: well casing, well logging, well casing, well tubing, cut, cavern for storage, brine production, leaching strings.