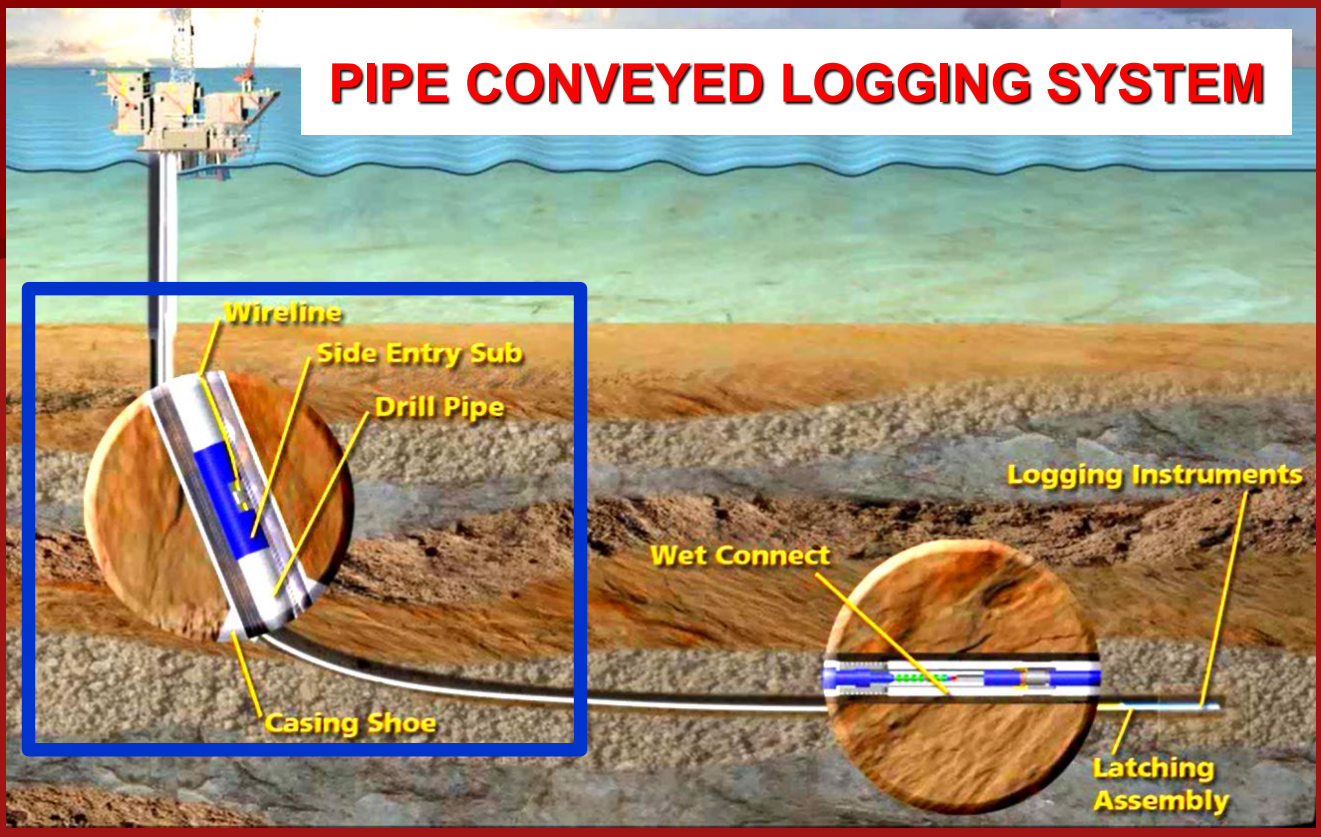
Pipe Conveyed Logging Enhanced Side-Entry-Sub System



Benefits and Advantages Over Current Systems

- The SES large flow-through hole allows high circulation rates of drilling fluid and running pipe-recovery or fishing tools at all times
- The SES cable pack-off has been successfully tested at 9,000 psi
- The SES Cable Cutter can be activated at any time by pulling a pre-defined high tension on the cable and it keeps the lower section of the cable attached to the SES after the cut is made
- The SES Cable Cutter performance is independent of the cable strength and condition
- The SES Flapper Valve provides an additional well control barrier while allowing pumping drilling mud or running tools through it

Rev: 2018-10-02

GENERAL

The Enhanced SES System includes:

- High-Strength High-Pressure Side-Entry-Sub (SES)
- Cable Cutter Sub (CCS) attached to the bottom end of the SES
- Flapper Valve (FV) mounted on top of the SES

The SES can be used without the CCS or the FV and yet it is the CCS/SES/FV combination that offers the performance and well control advantages listed

This CCS/SES/FV system is compatible with 6-5/8" DP, 5-1/2" DP, 3-1/2" DP and 2-7/8" Tubing.

DIMENSIONS

SES max OD	SES Flow-Thru Path ID	Connection
9''	2.9''	6-5/8''
6.77''	2.17''	5''
5''	1.97''	3-1/2''
3-3/4''	Not Available	2-7/8''

OPERATIONS SEQUENCE

After the CCS/SES/FV has been installed and the wet-connect latching has been successfully achieved, the cable clamp within the CCS is securely attached to the cable before starting the Pipe Conveyed Logging operations.

If it becomes necessary to remove the cable running outside the DP and seal the SES fluid path, a pre-defined high-tension pull is applied by the winch unit that:

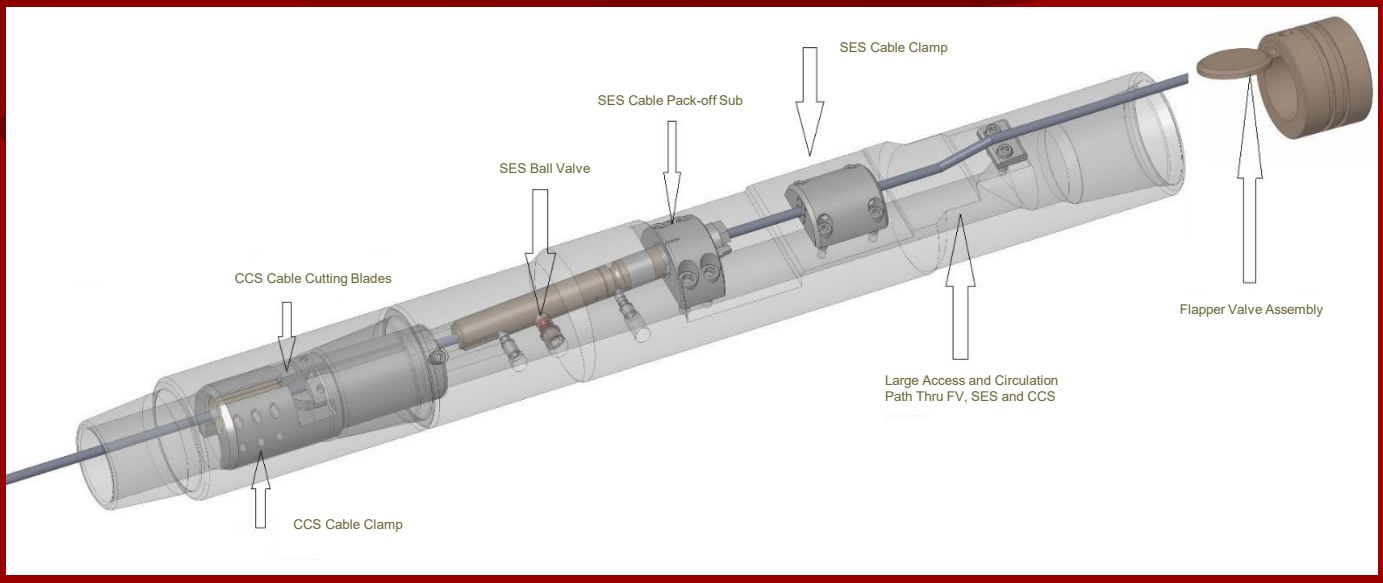
- breaks the shear screws holding the cable outside the SES
- activates the CCS cutting blades

After the cable is severed:

- the upper section exits the SES to be safely removed from the well
- the SES ball valve is activated to seal the SES pack-off fluid path
- the lower section of the cable is retained by the CCS cable clamp

At this point, with the SES sealed and the cable out of the way, contingency recovery operations such as drilling fluid pumping, stuck-pipe, pipe-recovery and fishing operations can be safely performed.

SYSTEM DIAGRAM



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