

Closed system moves cuttings from shaker to plant

DRILL CUTTINGS DISPOSAL is an operating and financial challenge in offshore drilling operations, and is now a critical element of well planning and execution.

Regulations and good environmental protection practice have brought innovation in both processes and equipment. Slurrification of cuttings and “skip and ship” processes are options, but each has its limitations.

A new system, the CleanCut™ process, combines equipment manufactured by **Clyde Materials Handling**, part of the **Clyde Blowers Group**, and service provided by **SWACO**, a division of **M-I LLC**.

The system conveys drill cuttings in a totally enclosed system from shaker to storage, storage to boat, and then from boat to a receiving station onshore prior to processing.



In enclosed handling system, CleanCut Cuttings Blower conveys drill cuttings from the shaker ditch outlet to ISO-Pumps.

PROCESS AND EQUIPMENT

The CleanCut system uses 2 main pieces of equipment. The CleanCut Cuttings Blower (CCB) conveys cuttings from the shakers into the system; the ISO-Pump™

is a combination storage vessel and conveying unit built within standard 20-ft ISO container dimensions.

In the first phase of the process, cuttings exiting the shaker ditch are fed into the Cuttings Blower on a batch basis. The cuttings are then conveyed in their raw state using positive air pressure to an ISO-Pump located elsewhere on the rig or platform.

The number of ISO-Pumps required on a rig will vary depending on the characteristics of the drilling and logistic programs, but typically ranges between 5 and 15. The ISO-Pumps are filled in sequence by opening and closing diverter valves.

ISO-Pumps act as storage vessels for the cuttings during their time on the platform.

Once the supply vessel arrives, the ISO-Pumps' second function as a conveying unit allows the material to be transferred directly via a flexible hose to identical ISO-Pumps mounted on the vessel.

Then the platform pumps are again free for storage.

In the final step, the supply vessel returns to harbor where its ISO-Pumps can be emptied either by discharging the material to onshore containers or by lifting the ISO-Pumps directly from the vessel for transport to the cuttings processing facility.

The CCB weighs about 1.5 tons and measures 1.4 m by 1.4 m, excluding the feed hopper. Air is supplied to the unit at 7 bar.

Each ISO-Pump has a capacity of about 15 cu m, or 95 bbl. Empty weight is about 5 tons, full weight can be up to 30



The number of ISO-Pumps located on the rig for interim storage of drill cuttings will vary depending on rig characteristics and logistics.

ton. Dimensions are 6.1 m by 2.45 m by 2.6 m.

Load cells mounted in the support frame indicate loading status.

FIELD EXPERIENCE

The CleanCut technology has been subject to a substantial development program, which began in 1998. The CCB has been in service offshore UK since mid-2000, and has successfully and reliably conveyed a wide range of cuttings types generated with both oil-based and water-based muds.

Full ISO-Pump containment and rig-to-boat transfer trials commenced in autumn 2000, and full-scale operational capability has now been proven.

APPROACHES COMPARED

CleanCut is said to offer advantages over slurrification and skip and ship methods.

Slurrification requires adding fluid to the cuttings and maintaining them in suspension so they can be pumped more readily. The added fluid may account for 20% to 50% of the volume to be pumped.

If drilling fluid is used as a suspension agent, it represents an additional expense and it must first be shipped offshore, then back onshore as part of the final mixture. Large mixing tanks must be placed on location.

In the “skip and ship” process, cuttings are lifted onto the supply boat in metal storage boxes. Often, a large number of these boxes are required for offshore storage and finding deck space to store and access the containers can be a problem. Handling the storage boxes is difficult and generally requires a large number of crane lifts; it can be difficult to determine the weight of individual skips, adding the risk of overloading.

Safety is always a concern when moving large boxes around the deck and lowering them overboard.

CLEANCUT ADVANTAGES

Providers of the CleanCut service cite advantages in safety, ease of use, reliability, and environmental protection.

Safety is improved by minimizing the number of crane lifts.

The system is easy to use for several reasons:

- Its flexible installation requires less rig space;

- The system can transfer raw cuttings at rates of up to 40 tons/hour;

- Cuttings are transferred to the supply boat through a quick-connect flexible hose;

- Material quantities are minimized, energy consumption is reduced;

- Personnel requirements are minimal; normal system operation is semi-automatic;

- ISO-Pump is certified by DNV for shipping worldwide as a standard container.

System providers say its reliability comes from the fact that the conveying technology has been proven in 3 decades of tough service in a range of industries. The Cuttings Blower has only one moving part—the inlet valve.



The same number of ISO-Pumps are usually installed on the boat as on the rig. Material is moved from rig to boat with flexible hose.

The system offers environmental benefits because it is totally enclosed and can encompass the entire cuttings supply chain.

According to the system providers, it is the first integrated solution from “shaker to process plant.” ■