Drilling Waste Management Systems

Solids Control Systems & Products

Improve drilling efficiency and environmental compliance with an integrated solids-control system

The goal of all modern solids-control systems is to reduce overall well costs through the efficient removal of drilled solids while reducing and minimizing the loss of drill fluids. Additional goals include worker health and safety and environmental compliance.

The key to designing the best systems in the market comes down to working with the rig designers, contractors, operators and ship yards to provide the best in class.

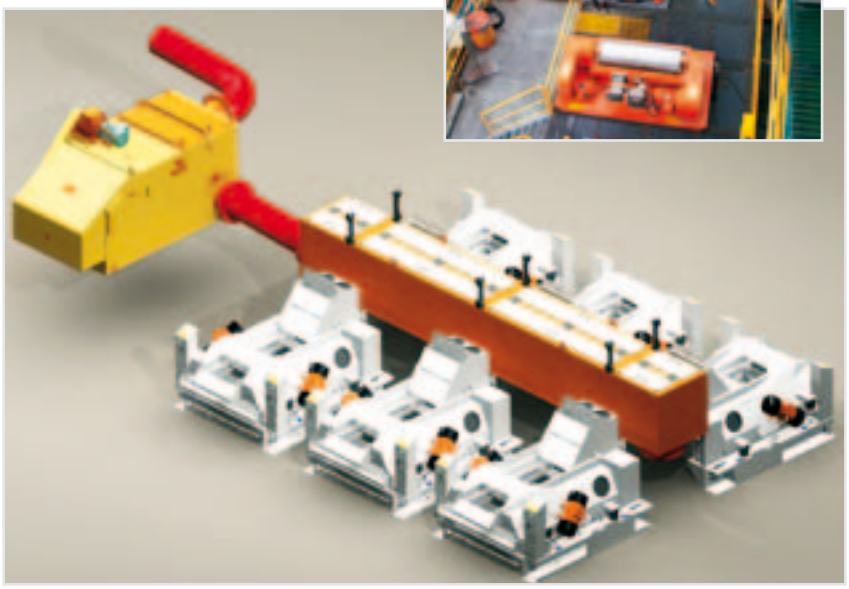
To operate each type of equipment so that the maximum separation efficiency is achieved requires a lot of thought, and many factors must be considered. The quantity and sizing of equipment must be specific so that the efficiency of the solids-control system can be maximized through data such as final volume of mud accumulated while drilling, total volume of solids removed and fluid dilution rates. The greater percentage of drill solids removed and drilling fluid preserved, the higher the operating efficiency.

Redefining solids control through the systems approach

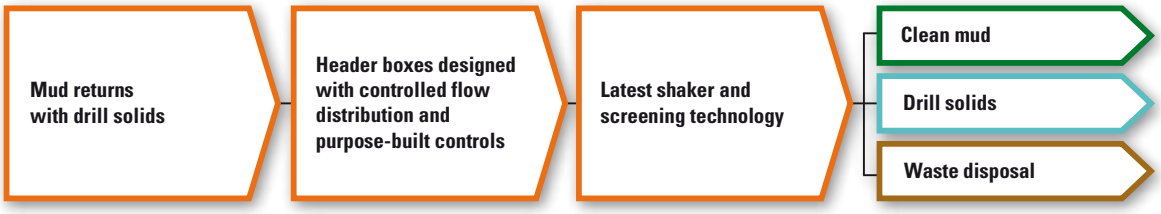
To meet the demands of new advancements within the drilling market, M-I SWACO has looked at the wider drilling process to design a fit-for-purpose solids-control system. Incorporating modern drilling methods, new equipment enhancements and understanding issues such a limited-discharge legislation and drilling-fluid properties, we have designed the best-in-class system for the market.

We work with the customer at the project and local operational levels so we can transfer process knowledge and practical operational experience to the system's design. This helps ensure that the system meets the requirements for today's drilling practices and allow expansion for tomorrow's.

As the heart of the fluids process, solids control is the key to cost reduction. Ensuring its effectiveness lies in understanding that different drilling operations will optimize, and must be able to configure, the installed equipment in different ways. This is how the volume of liquid contents in the waste stream is minimized, reducing waste-processing costs. Tight control greatly reduces the need for dilution, and this further minimizes fluid and waste-processing costs. The key to accurate process design is applying comprehensive analysis techniques and competently executing their application.



Delivering solutions



Accommodating the process-design variables

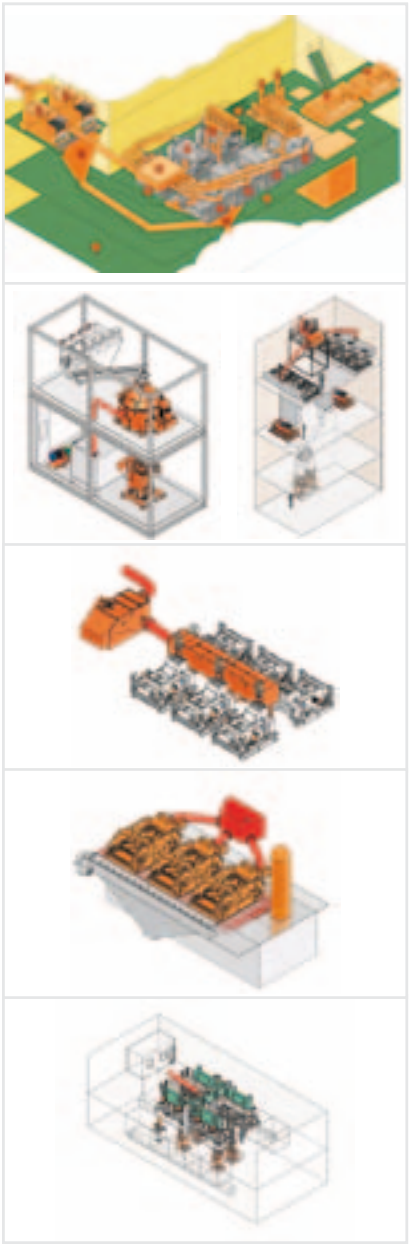
The first consideration in designing the solids-control system is that there are enough shale shakers to process the drilling fluid, accounting for circulation rates, mud types, water depths, drilling-fluid properties and separation parameters to a given specification. The goal is to remove as much of the drilled cuttings as possible. Given the importance of the shale shaker, it is also very important to understand the effects of separation efficiency on screen life with different motions and G-forces. M-I SWACO helps clients determine the most efficient shakers and screens to achieve optimum economic performance of the solids-control system.

The separation performance of a shale shaker screen is normally represented by the percentage of drill solids removed and the screen life. Grading the screens will vary from manufacturer to manufacturer, but the best way to compare is to look at fluid volume capacity versus solids-removal efficiency.

The mud cleaner is a bank of hydrocyclones mounted over the shaker. In some installations, there are desander and desilter cones mounted in such a way that the unit can be used as a mud cleaner or as a shaker and hydrocyclone unit separately. With today's finer-screening shakers that have higher overall efficiency rates than the traditional linear-motion shakers, the applications for mud cleaners are limited.

Decanting centrifuges are a very important component of the solids-control system and understanding how to optimize them can be challenging, but when used properly, they are a very valuable asset to complete the system. Centrifuges are capable of removing very fine solids - down to 5µ - that cannot be removed by any other equipment. The centrifuge can greatly improve the separation efficiency of the solids-removal system while drilling with water-base muds to assist in the reduction of liquid-discharge volumes.

In weighted muds, the centrifuge is used to reclaim barite while removing colloidal solids that can cause high mud viscosity, poor filter-cake properties and decreased penetration rates. The centrifuge is the primary separation device used in a chemically enhanced dewatering system to reduce liquid discharge volumes.



Sample configurations