

Raptor Rig: Making concept a reality

Working on the rigs is never easy, and is a labour intensive job with long and strenuous hours. The backbreaking life of a roughneck, the iconic worker bees of oilfield drilling rigs, is getting a little easier, though, with Raptor Rig, the world's first fully automated drilling rig.

In an interview with **Brett Chell**, Co-Founder, Raptor Rig, he described the myriad of benefits the rig will be able to offer to operators and rig workers, and how the rig's idea came to be. "**Richard Havinga** and **Reg Layden** are my two partners. Rich was the ex-President of Xtreme Drilling and Coil Services and Reg was GM of International Operations. Reg was also a part of Technicoil. The guys I'm involved with, there are only a few guys in North America that have the experience they do in building rigs," Mr. Chell said.

Mr. Layden is recognized as a veteran innovator in the oilfield community, considering his two and a half decades' experience in cutting-edge rig design, development and operation. Mr. Havinga has an extensive history in new product development, engineering, manufacturing and design in oilfield experiences.

Mr. Chell said Mr. Layden and Mr. Havinga have been building and innovating the whole time. "We have to stop making these small changes, we need to wipe the table clean. We have enough experience to know what the industry wants, and build that platform. It's similar to a triple that's out in the field right now except for one major difference: that simultaneous connection system. (TM)."

"The last revolution that they pioneered was heavy coil. They designed hybrid rigs. Reg was the guy who invented a lot of the equipment and operation behind those rigs. They wanted

to find a way, first of all to automate, the drilling rig in a practical sense that worked in the field, and they wanted to find a way to join the rigs with all their benefits running in and out of the hole as fast as coil did," Mr. Chell added.

The idea to start Raptor came from a belief that while downhole technologies have come a long way, beyond the top drive and some "mechanization" very little actual improvement has been made to the drilling rig itself in the last 100 years. Since the step change between the cable tool rig and rotary drilling, not much has changed, let alone comparing drilling rig advancements to other industries such as the auto industry.

"I looked at all the pros and cons of existing designs i.e. triples, doubles, and super singles, and also at notable attempts at adding efficiency such as hybrid rigs and coil. It showed that an existential look at how a rig is designed could accumulate most of the rig up and safety aspects of the designs fairly easily, the real challenge was how to combine the operating efficiencies of all these rig designs in a practical, efficient, safe and repeatable fashion," Mr. Layden said, adding "the hardest question was how do we trip like a triple (or faster) drill like a single (or faster) and maintain the circulation benefits of nearly no connections like coil?"

The rigs are hyper efficient, completely eliminating the need for workers on the floor and reducing overall drilling cost by 30 per cent and overall connection time by 70 per cent.

One of the biggest benefits to the operator is that they're drastically reducing connection time. With the advancements in downhole technology, connection times represent a significant proportion of overall drilling time.

The process also makes working safer, most notably on the floor. It takes guys off the floor, which is what companies are looking for.

The prototype rig will take 14 months to build. The logic behind the design is to make drilling affordable in the current market making the business plan one of displacement of existing rigs, not just adding to an overbuilt fleet.

Raptor's team deploys an innovative and progressive thinking thought process for the industry. "We really just try and look for disruptive technology and evolve. We keep our eyes open to the opportunities in the market, and where we think a market's going to go and where there are inefficiencies," Mr. Chell said.

Mr. Layden believes the rig is a demonstration that Raptor Rig has a progressive mind towards using technology to help a company evolve. "The vision definitely doesn't stop at creating efficiency in the drilling process itself. It evolves into true integration and optimization of other cutting edge drilling technologies such as directional drilling, managed pressure, and underbalanced drilling making these more efficient and affordable requiring less time, money and people. The raptor drilling system (SCS) easily lends to these integrations. We are proactively designing these efficiencies into the rig as we speak and will be collaborating with experts in these fields to help us further add value to the operator. Stage two of the Raptor plan is to then take all the established technologies and utilize their efficiencies in the live well intervention market and make a notable step change in those operations as well."

"This is the beauty of what we have designed. We have designed a system that takes all of these aspects into account and still adds immense efficiency and cost reduction to the customer. In today's market of low oil prices, efficiency is the difference between feasibility or not," Mr. Layden exclaimed.

"In defence of the drilling industry when people compare it to the auto industry for example, they might not be aware of the unique challenges drilling faces, such as the fact that it has to be able to tear down, move, rig up and function perfectly in a matter of hours to a few days (depending on rig size) and has to be able to operate in the most extreme environments on the planet from freezing to sweltering hot in remote areas and also be self sufficient in many cases. I believe this is one of the reasons drilling hasn't changed much in the last century," Mr. Layden mentioned.

"Pretty much everyone we've shown the rig to, has taken a step back. They think it's going to be a big deal," Mr. Chell said.

Raptor Rig has a goal of "improving the efficiency in the oil and gas world, lower costs for operators, and make it viable for us to compete at \$45-55 oil. We all hope it goes back up, but if it doesn't, we can still compete, regardless of what's affecting the price."

"We hope this rig is going to change the drilling industry forever," Mr. Chell exclaimed. "We absolutely believe this is a game changer, of equal magnitude to when the industry went from cable tool to rotary," Mr. Layden boasted. "I don't see the industry reverting to old technology when there is a drastically more efficient and safer way to do business available. Our ideology is displacement of equipment not just adding to an oversaturated market and thus sees an unprecedented growth potential, and or even "need" for this technology. Our goal is to notably improve and change the way the industry operates today bringing it squarely into the 21st century as the drilling contractor of choice with the "Top Tier" drilling technology," he concluded. ⊕