

National Oilwell Varco, Inc.

Analyst Day 2018

ISAAC JOSEPH
President, Wellbore Technologies

[Video plays]

Unidentified Speaker: A pedigreed history of experiential prowess. Down, down, down the path he goes. Fluent in the language of machine, he senses the environment and speaks in real-time to achieve peak performance. He's the doer, the go-getter, the underground explorer. He is the driver. This is Wellbore Technologies.

[Video ends]

Isaac Joseph: That's pretty much the way I feel when I drive down the beltway in the morning. Good afternoon. My name is Isaac Joseph, President of Wellbore Technologies. This is the agenda we'll be covering. Hopefully, it'll give you deeper insight into our Wellbore group today. We're going to cover the segment overview, some financials, industry trends, some of our technology as it relates to directional drilling and closed-loop automated drilling opportunities.

So, let's get started. We'll start off with our vision. It was driven by a culture of safety and quality. We empower our customers through leading edge technology and service through a very extensive global footprint. At the end of the day, we are a provider of solutions for our customers.

We have six business units today that comprise Wellbore Technologies. All the business units are either one or two in their respective markets and all of them but one have over 50 years of experience in the marketplace. We know how to operate in the oil business today and have had very good success in the past and are well-positioned for the future.

Let me give you a little bit of our revenue mix. This is comprised of over 5,000 accounts; 38% of our revenue mix is from the IOCs and North America [NAM] independents. We have our NOCs that make up 17%. We market to those two segments very heavily and our channel to the market is through service companies, which independently make up 15% of revenue. Drilling contractors, of course, are 12%. Manufacturing and others make up the remaining 18%. What this really entails here are distributors and we have our OCTG manufacturers that we are very closely tied to with our Tuboscope product line.

If you look at the land and offshore mix, it is 85% land and 15% offshore. As the business was pivoting away a little bit from offshore, we got really, really focused on our land business, not that we weren't before, but even more focused these last two years. If you look at our NAM to international split, one of the things we try to do is make sure we have a good balance here. So, let's talk a little bit more about our historical NAM versus international mix.

As everybody knows, in 2014, things were going pretty well. Life was good. In Q4 of 2014 and into 2015, a downward slope in NAM hit very hard, a generational downturn. Of course, we sized the business properly to meet demand.

At the same time, our international business did have a slight downward slope, though not quite as exaggerated as you see in the NAM business. NAM has recovered. When we look at 2017 and 2018, we're having recovery. We refueled the company. Our headcount in 2014 were somewhere around 21,000 employees and we got down to about 13,000. Today, we're around 14,500. We have refueled, but we're still very careful about what we size.

We point out drillpipe here because when you look at the revenue makeup of Wellbore, we're a very short cycle business unit outside of our drillpipe product line which is the Grant Prideco™ piece. As you know we still had pretty good backlogs in 2014. Through 2015, 2016, and 2017, we had inventory to burn off and, from a capital expenditure perspective, there was a lot of lack of investment in that particular area. However, as you can see in 2018, we're seeing a very nice rebound. Hopefully, we're at the bottom of the cycle and things are moving upward.

Now, just a little different view of the financials. I gave you the revenue mix. If you look at 2014 as we mentioned earlier, it was a pretty good year. Things were going pretty well. 2016 hit, we resized the business and then we rebounded in 2017 and more importantly in 2018. So, if you look at 2016 compared to 2018, we're going to be about 46% revenue increase from 2016, and the data point here is that our international business hasn't started really clicking here and our offshore business is at 15%.

Hopefully we'll get up to 20% next year if we get a slight rebound in the offshore market. Hopefully in the second half of 2018, we'll see the international market picking up. As always, the US market and NAM normally leads a little bit before international markets.

Let's talk about the six business units. I want to give you a little color here so that you have a deeper understanding of our Wellbore business. Grant Prideco is the worldwide leader in drillstem manufacturing. We have seven locations today around the world that we manufacture drillpipe and drillpipe accessories, heavy weight. In Grant Prideco, there's 27 different premium connections that we offer and these premium connections are made for the challenging wells that we see today. The different basins, the different rock formations, the connections are tailor-made for these types of formations.

It's a fully integrated company, vertically integrated with supply chain. We have voestalpine™ as a joint venture. They're out of Austria. They make a world-class tube and also in here,

Tuboscope™ coats about 85% to 90% of the drill pipe that comes out of these facilities. So, we have a lot of intercompany between the two.

So, speaking of Tuboscope, 85-plus years in the business, 220 locations worldwide, leads the industry in tubular inspection and internal coatings. We have the latest technology with our phased array inspection equipment. We have over 12 internally plastic-coated offerings for all the different environments that we encounter today downhole.

Just a tidbit of information here, this year, we'll inspect over 92 million feet of casing. So, we touch a lot of the wells that are running casing in NAM today. We are coating over 25 million feet a year of tubulars within Tuboscope. A very diverse customer base and it's pretty much leveraged with 50% drilling, 50% in production. There's a lot of reclamation workover business that's also implanted here in the Tuboscope product line.

Wellsite Services is the home of Brandt™, the leading solids control name in the business for services and equipment. Today, we support right around 400 rigs either from support and rental. We are the leading screen manufacturer with four manufacturing locations around the world. Embedded in wellsite services is MD Totco™ product line. MD Totco is a surface drilling automation provider and its visualized solutions at the rig site. Today, MD Totco products and services are on around 525 rigs.

Just a little bit of data points on MD Totco, they gather all the surface data that comes up from the bottom of the well. For instance, they give the surface weight on bit which is an average. We talk a little bit about the directness that we have with our tools, hook weight, block height, et cetera, but it also covers a lot of administrative duties that happens at a rig, payroll for the rig, contractor, etc. It gives all the well operations for the rig contractor. So, it's really our digitizing group within Wellbore and we are looking towards more development in the future here with surface automation.

ReedHycalog™ has been in the business for over 100 years and has industry-leading cutter technology. This is where we have our ION™ 3D cutter as well as the originator of the deep leaching process that's being used on PDC bits around the world today. ReedHycalog has very strong DNA on technology and as we'll get further into that as we match it with some of the laterals we see today. Also, in the ReedHycalog unit, we have embedded an independent provider of our rotary steerable product line, as well as MWD and LWD tools. These are our products that we offer to the directional drilling market.

Today, we have over 600 MWD kits in the market that we support. We have a three-product offering in MWD. We just sold two resistivity tools, LWD, one as kit into China and just more recently one into Russia. We have an offering with three rotary steerable tools that we'll talk a little bit more about here in the next coming slides. The idea here is either we sell or rent these products to directional drillers and we market again to the end user or the operator, so we get this equipment specified.

We're also first to market on downhole data driven closed-loop automation, which we'll have some illustrative slides here very shortly. Downhole is the leading independent motor manufacturer in the industry. Downhole makes its own motors. Today, we have four manufacturing locations around the world with proprietary motors. We also make coiled tubing motors and coiled tubing agitators along with our downhole Agitator™.

With extended reach laterals, the Agitator™ is the friction reduction tool in the market. It is an enabling technology and one of the most important tools in reaching your extended laterals today. Also, here in Downhole is our Bowen™ fishing tool product line. 80-plus years as a standard provider of fishing tools. At any given time, we have around 450 motors in the market today on rental. So, as we'll see, we have some new technology we'll talk a little bit more about here shortly.

IntelliServ™, the only commercially available wired drill string associated telemetry network in the business today. It's been in the business for about 10 years. It's field proven wired pipe technology for land use offshore, 99% uptime. We just recently sold two strings for a major land contractor in the US. Today, we're on six active jobs and forecasting next year to be somewhere around 10.

So, let's look at the global footprint a minute. This is how we market to make sure that we can get our products around the world, close to our customers' oil fields, and make the logistics and repair of this very seamless operation function.

Embedded here in the red dots is our manufacturing facilities. For instance, we are operational with a drill bit manufacturing location in Saudi [Arabia]. We also manufacture drill bits in Russia, of course in Conroe [Texas], and in the UK. That just gives you a flavor for where our manufacturing is, and we also are very much in tune with local content. You can see that we are located next to every major oil and gas field.

Now, some industry trends. –Let me touch on the background here, though you probably know as much as I do on these slides. As you can see, the unconventional are moving up [in the US land market] from 2005. It represents about 90% of the [US land] activity today. And the cost-per-well, as you all know, is going up along with it. Longer laterals lead to higher risk. So, let's talk a little bit about the risk that we see in these complex laterals.

I think Clay had mentioned this morning - and there was video as well - that a perfectly straight wellbore is a necessity. It leads to tortuosity if you don't have the proper wellbore being drilled with straightness. You'll end up with a curve which creates torque and drag and a poor[er] return on your investment.

This is just a slice of things that happen in the wellbore. Of course, your torque and drag affects your rate of penetration, your ROP. Decreased torque at the bit is another culprit of torque and drag. Premature pipe failure or tool failures. Also wear on your pipe, or a situation where your

casing doesn't go to the bottom of the hole. This is a very expensive issue and, of course, stuck pipe. All of which causes the cost of the well to go up.

The effect of this is poor completions, poor production, missing the pay zone - which is never a good thing - and slug flow for lower recoveries. Basically, there you're pooling your product in the lateral, not getting it to market. Well returns are pretty important.

So, how do we protect your ROI at NOV? As illustrated here, we have some technology that will either diminish or greatly reduce these issues. From a directional drilling perspective, the technology we have to offer in the marketplace, we start off with our SABRE™ product, which is at the surface. SABRE is a first of its kind modular [shake shaker] system. It handles twice the amount of fluids than what is out in the marketplace today. It decreases your haul off cost which is a cost savings. And as you can see, this is a triple-deck system.

Again, most of the time on the land spreads, you'll have three shaker systems. With SABRE, you only need two. It matches the amount of the high horsepower rigs that are out today. If you don't have the right solids control equipment, it can be a bottleneck for you in drilling a well.

If we go down this 10,000-foot lateral, we'll see Delta™. Delta™ Premium Connection is designed and manufactured for the 10k [ft]-plus laterals. This connection is specifically made for un conventionals. Faster makeup, 40% faster than the next premium connection, that's a savings at the well with quick makeup times, reduced repair frequency. Cost of ownership is really down by 60% on this connection. Today, we have about 2.3 million feet of it in the market. It is the fatigue-resistant connection in the marketplace today.

Let's talk a little bit about the Agitator which I mentioned a little earlier. We've had over 75,000 runs with the Agitator. It's a friction reduction tool. It is the enabler for some of the longer laterals we see today, and it's 99% reliability, so, a very much a stalwart in the lateral business.

Now let's talk about SelectShift™. This is one of our most disruptive technologies. It's the first drilling motor in the market today that you can adjust your bend settings downhole. So, what does that really mean? That means you don't have to trip out of the hole and trip back in the hole and having an extra cost of \$75,000 to \$100,000 for a trip. It's a very big technology move in this particular area. You've got unlimited changes, straight to bend. It outperforms any conventional motor that's in the market today. Its ROP is outstanding. It is commercial. We are really moving forward with manufacturing in a big way.

This motor can revolutionize the way wells are drilled with motors. We all know that our operators like to drill wells with motors. They are using rotary steerable today. But they really like using motors for a lot of reasons, cost being one of them.

Let's talk a little bit about that. If you look at the Spears [& Associates] report here from 2005, you see of course rotary steerables being a big part of the picture and growing. If we were to wedge SelectShift™ in 2016 and 2017, we feel we would have had a bigger piece of the

conventional motor business and we would probably have trimmed off a little bit of the rotary steerable. This SelectShift motor can drill a curve to 13 or 15 degrees and go into the lateral with great ROP. We are very excited about it. We have over 45,000 or 50,000 feet today of drilling time on this particular motor and it's performing outstanding.

Longer laterals mean more tool consumption, complexity, and risk. So, let's go out a little further from 10 to 15 [thousand feet laterally]. Now, we would suggest wired drill pipe, of course, but wired drill pipe can go through any well application there is.

BlackStream™ EMS is our proprietary tool. It has all the measurements of RPMs, torque, weight on bit which are very important. It's one of the only tools that has both pressure and temperature. It is designed to connect with IntelliServ drill string and it's being mostly used in the US and in the North Sea.

We marry this with our VectorEDGE™ rotary steerable, push the bit technology. We all know that it's critical to maintain your sweet spot for your pay zone, but what we really are aiming here is to be a low-cost provider of a rotary steerable tool. The tool is around 30% less than the next comparable rotary steerable tool in the marketplace.

We are pretty excited about this technology and we also marry it with our Tektonic™ bit, which is loaded with premium technology. It is manufactured and made for fast drilling. It is made for the laterals that we see today in the marketplace. We've had 11,000 plus runs since 2015 and we still have some growth here with this particular bit.

What you have just seen is the ability of NOV to provide kit to the directional drillers in the marketplace. As you can see, we have a rotary steerable tool here, resistivity, our SelectShift and we are poised to supply the directional drilling business which is around a \$9 billion market. And we'll supply any independent directional drillers, 131 in the marketplace today on a worldwide perspective, and we feel like we're poised to help them attain the goals that the operator, their customer, is asking them to do.

Let's talk a little bit about closed-loop automated drilling. Joe talked about faster and safer [drilling]. That hasn't changed when you get to this [closed-loop automated drilling]. Staying in the pay zone is a very important piece of this and the data that we're going able to supply the operator and driller with is outstanding, data-rich information.

Here are a couple of the apps that we have designed. They go along with these smart downhole tools. Let's talk a little bit about the TrueDrill™ [app]. It gets information from the BlackStream™ EMS tool. The app takes this information and brings it up to the surface to the open architecture of NOVOS™. The real strong performance of EMS as it goes to direct measurement weight on bit, is that it is not an average [measurement]. This is a direct.

The driller can really look at what's the proper weight on bit that he needs to have to drill a proper hole and the speed he's looking at. BlackStream™ ASM feeds the EMD Viewer which is

the app to reduce your probability of stuck pipe. It measures the amount of cuttings that are coming out of a well and it's a warning system that you're getting close to a stuck pipe occurrence, which is a very costly occurrence. BlackStream ASM has some of the properties that we have with our EMS tool, but it does not have weight on bit or torque in the measurement in the tool.

So, these two tools work alongside our DrillShark™ app, which is our drilling optimization tool that basically finds the right spot where the surface automation is used to direct the equipment in the proper way. In other words, how fast do you want to turn the bit? How fast do you want to turn your drill pipe? What's the RPMs at the surface? It takes this data and produces all that data for the driller that sits in the cockpit.

The Envelope [app] is nothing more than staying in the safe pressure window to make sure that you don't trip too fast or your ROPs are getting out of control. It keeps you in the safe zone of the well, helping you avoid damaging your formation. These apps were developed in the last five or six years and this all is on the NOVOS open platform.

Let's talk a little bit about mud-pulse as it relates to telemetry. As you see here, this is driving without your lights on. Mud-pulse is around 4 to 16 bits a second compared to telemetry at 57,000 bits per second. I would much rather have lights on downhole, as was discussed in the video by Oxy. This is the difference between mud-pulse today and high-speed telemetry that a wired drill pipe offers.

Some of the things that high-speed telemetry brings to the game are that it enables downhole smart tools, it enhances your well directional control with better well placement which is critical. Cleaner casing runs, more effective completion operations. So, you can drill a well, but you've got to have a really nice wellbore, a clean wellbore, so that you can have a good completion. It is just that overall better understanding of the wellbore.

The drilling mechanics become a lot easier, as John [Willis] mentioned in his video. This is the internet to the bottom of the hole, frankly. So, wired pipe with Equinor. Jostein's team has basically made a decision that in all of his rigs he will roll out wired pipe.

Equinor's intent is to have wired pipe on all of their rigs worldwide, including their partner relationships, which will be in the Gulf of Mexico and Brazil. As you can see, the wired pipe technology is taking hold in the market. Along with the tools that enhance wired pipe's capabilities, a major NOC in the world has decided to take this on.

[Video plays]

Unidentified Speaker: In 2011, NOV invested in a unique and dedicated R&D facility to advance the technologies in the wellbore on a fulltime basis. This center opened in 2014 and has since been responsible for dozens of product and technology innovations throughout the oilfield.

NOV found that the ability to continuously access an operational drilling rig meant that the company's engineers and scientists could iterate on their designs and technology and quickly get them back downhole to assess progress against operational objectives.

This facility has been a key success factor in NOV's ability to bring new products to market, allowing the company to advance the level of technology employed in customer operations around the globe over the last four years.

And it represents our commitment as market leader to also be at the forefront of technical leadership for our valued customers.

[Video ends]

Isaac Joseph: Wellbore. We do the best we can to anticipate market trends and have the design solutions to meet our customers' needs. You saw some of the technology we have which was developed in anticipation of longer laterals.

We're an independent supplier to a broad customer base and we take pride in being an independent supplier. We are changing the industry with some of the technology I just talked about -- SelectShift, Sabre, Delta, etc. and we will continue to be a force in disruptive technology.

We enable and inform drilling decisions with real time downhole data, which we think is the wave of the future. It continues. It's here today. It's going forward quickly. We also have a trial going on in the Middle East here in April of next year, again with a major NOC. I think it was asked earlier how's it moving? Downhole data acceptance, of course, it's a little slow, but it's really taken off here in the last year and a half. A downturn always brings out the best of this technology.

Thank you.