

National Oilwell Varco, Inc.

Analyst Day 2014

NOV Completion & Production Solutions

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In 1980, Kirk began his career with TRW Mission and became part of NOV in 1989 as part of the first acquisition undertaken by the recently merged National Oilwell. Kirk held numerous roles including inside sales and operations, outside sales and sales management. He became Vice President of Sales and Operations for all products sold under Mission in 2000, and Kirk became President of this group in 2007. In 2014 Kirk became President of NOV Completion & Production Solutions.

You've heard from Joe and you understand the truly bright days we still have ahead in our Rig Systems Group. You've heard from Mike and you've seen the incredible ways that we make the drilling of oil faster, safer and more efficient and the things that we're going to do in the future to continue that process. Now let's talk about how NOV participates in the market once the drill bit stops spinning.

The products and solutions in this segment come to play as the operator completes the well and then continues on through the production phase of the well. We are probably the segment that you know the least about. We're the smallest segment. We have aspirations for greatness, and I hope, during the course of this presentation, you can truly come to understand how we use our products and services to generate revenue for our company.

As we move through this presentation, you're going to see numerous examples of the NOV way, or our path to success. You're going to see that we have products and strategies that are in varying stages of their evolution, and as a result, we have significant opportunities for growth ahead.

As we look at the market, today's little blip in oil prices notwithstanding, we see a continued expansion of unconventional, hydraulic fracturing, both in North America and around the world. We see that drilling is going to take place in deeper waters, in some of the harshest environments on the planet, and this is going to drive a need for more and more offshore production equipment, ultimately leading to what we would call maybe our first really significant order in the FPSO space in roughly 2016.

The key to delivering the products and services that our customers demand and the growth that our investors deserve is our people. You're going to see areas where we have achieved significant success, and you're going to see areas where we're still on the pathway towards a type of market leadership that NOV is known for. These successes can only be achieved through the drive, determination, dedication and innovation of our people. It is through innovation, product creation, service delivery and a singular goal to move our customers' business forward that we can achieve true success. We have 14,500 fine folks dedicated to making a difference for ourselves, for our customers, and for the communities in which we live and work.

We're going to talk about the products and solutions from this segment from two viewpoints today. One viewpoint will be offshore production. As you will see, we have numerous ways to participate in this space and quite frankly, a great deal of growth opportunity ahead for us. As you hear me talk about our opportunities in the production space, I want you to keep a simple concept in mind. Our target market is a production well site. This can be a relatively simple well site on a dusty patch of land in West Texas or it can be a highly complex multi-billion dollar offshore production facility, such as an FPSO. Our goal is to provide the products and services that allow for the safe and efficient production of oil and gas.

The second viewpoint we're going to use to discuss this segment will be the unconventional oil and gas opportunities. You are all aware of the opportunities we've had in North America with the ongoing activity in our shale plays, but as you can see by this map, there's a world of opportunity out there for the use of our products and services by the oil and gas companies to exploit these resources on a global basis. Nowhere has the development of unconventional been as successful as it has in the US, and this is due in large part to our systems and our



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land ownership laws. As others have seen our success and the economic benefit that we've realized from it, we see a driving effort to bring a robust unconventional market to their countries. As we look around the world and we think about where these opportunities will unfold first, we see Argentina, Saudi Arabia, Russia, China, and Australia. Each of these countries has their own challenges, their own obstacles, some that NOV can impact, some we can't. But nonetheless, this is where we see the opportunities coming to fruition first.

When you think of unconventional, undoubtedly the first thought that comes to mind is hydraulic fracturing, because without this technology, there would have been no boom in the unconventional market. Shown on this animation is the equipment that NOV manufactures for a hydraulic fracturing well site, from the wireline unit to the control band, the frac pumper, sand management, hydration equipment, blenders, manifold systems, portable flowline, even the frac tree itself. We have the most comprehensive suite of equipment in this market space today. We can provide virtually everything that's required to frac a well, almost to the point that all a customer would need to bring is a crew, a recipe and the ingredients for what they want to pump downhole. This is an excellent example of the NOV way. We started with individual products, we continued adding technology and services until we reached the point where we could provide the complete solution for fracing a well.

I like to think of fracing as one of the better business models in the industry today that we get to participate in. We take abrasives and we pump it downhole through steel, under high pressure for extended periods of time. Product quality is of the utmost importance, but nonetheless, pressure, pushing abrasives through steel creates a very robust aftermarket opportunity.

Another product we're heavily involved in that plays in unconventional is coiled tubing. Coiled tubing is manufactured as a continuous link for tubing, and it's stored on a spool. When it's time to go to work, it's deployed downhole through the use of an injector head. When the work is complete, it's returned to the spool. NOV is one of the leading manufacturers of both coiled tubing and coiled tubing equipment. In years past, prior to the rise of unconventional, coiled tubing was used for general well service, used smaller tubing, and the tubing lasted six months to nine months.

The rise that we've seen in unconventional and hydraulic fracturing has also created extremely strong demand for coiled tubing equipment. We find that the coiled tubing is used to drill the plugs out that were set in multi-stage fracing. We also see that coiled tubing is used to frac some wells. With this change in operations, we now see larger tubing in use. Instead of the traditional six to nine-month life on the tubing, we see 60-day to 90-day life.

In the past five years, NOV has placed in excess of 500 coiled tubing units in the marketplace. Each one of those would have an average life expectancy of about seven years in unconventional. Additionally, due to our market leading technology on injector heads, we've placed virtually the same number of injector heads in the market; some for use on upgrades on our own equipment, others for use with competitively manufactured equipment.

Wireline is another product that has benefited greatly from unconventional. Wireline really has three uses in the market. It's logging, it's completion, and it's well intervention. The rise in hydraulic fracturing has also driven strong demand for wireline. It's through the use of wireline that the logs are created to tell the operator where he wants to frac. The wireline can deploy the perf gun and fire the charges, it cuts the holes in the casing to frac through. We also see wireline used, in some cases, to set composite frac plugs in multi-stage fracing. In the past five years, NOV has placed in excess of a 1,000 wireline units in the market. Each one of those wireline units would have been accompanied by their 10K or 15K pressure control equipment.

You've seen a couple of examples where we have achieved some true market leadership with our products and services. Let's look at an area where we're still relatively early in the process. Well testing plays a key role in the development of unconventional. In years past, we've been the market leader with a provision of surface test trees and portable flowline. The equipment you're about to see turn blue is all the equipment that we can put on a well test site today. Our goal is to continue developing that suite of equipment, so that we could provide a complete well test site to a service company or possibly to an NOC that chooses to do their own well testing. This will be an area of continued growth for NOV, and we have some distinct plans for how to complete this process.

You've seen our completion equipment. We told you about the business model, high pressure, pushing abrasives through steal. How do we support this? Since it's all pressure containing equipment, we have huge opportunities for repair, recertification service. Our operators, our customers have to know when they pull on location to start a job that the equipment they have is safe, it's fit for the purpose at hand, but they also have to know they're getting the maximum use out of it. Customers tell us that a frac pumper requires a complete overhaul at 11,000 hours. In today's 24-hour operating environment, that can come in as little as two years. Pressure control equipment typically gets a complete recertification at five years; flowline, depending on the customer, recertified at six months or 12 months; and a frac tree, typically being rental equipment, is rebuilt at the end of every job.



Prior to the complete overhaul of any piece of equipment, we have a continuing level of service and a consistent consumption of expendable items, both of which are provided by NOV. Our customers can't afford to take their equipment out of service for extended periods of time, ship it around the world to get it serviced. We've established a network of service and repair facilities in all of the key areas, and we're committed to opening more as the need arises. Argentina is a perfect example of this. The shale plays are now coming to life, and we're in the process of establishing the infrastructure, the services, and getting the boots on the ground that we're going to need to support this upcoming activity.

As unconvensionals spread slowly around the world, there is a concept I want you to keep in mind. We're the only manufacturer offering this diverse suite of equipment on a global basis, typically from local facilities. We watch the world for those equipment opportunities that are unfulfilled, and then, we work to establish the infrastructure to fulfill those needs.

We've talked about the completion side of unconvensionals, but NOV also has a lot of opportunities for participating in the production side of this business as well. The colored equipment on this slide is equipment that's manufactured by NOV. As you can see, we've got a lot of opportunities to participate in the production phase of the business. This is a perfect example, where we started with a couple of small products, continued to add products, technology and services and to where we're now at the point where we are ready to offer the operator or the customer a more comprehensive solution to help meet his needs. If you think about how unconventional fields are being developed, really specifically in North America today, you see that the operators are taking a more industrialized approach to development. They've defined what a wellbore, a well profile, should look like for a given field. They've moved to pad drilling, more production on each site. What they really haven't done, though, is they haven't spent a lot of time trying to industrialize or standardize the surface equipment that's going to process the well output.

We think we have developed a broad enough suite of products and services that we can help drive that process forward. If you think about the vast number of wells that are being drilled in a given field, all to the same zone, then it becomes real clear that there's a real opportunity to standardize that process equipment on the surface. There may be some nuances from well to well, but we believe that our equipment can be configured to address a very high percentage of the wells in a given field.

If you look at how fast wells are being drilled, completed and brought online today, equipment availability, logistics to get the equipment to the location, as well as having adequate boots available to hook the well up is becoming a real challenge for our customers. This is a challenge that NOV is uniquely suited to answer. We have the broad suite of equipment, fabrication facilities, project management expertise and sufficient service personnel to get a customer's well hooked up and producing first oil days faster.

NOV entered the artificial lift business in 2003 with the acquisition of our progressive cavity pump line. Since that time, we've added several interesting pieces of equipment to our portfolio, quite a bit of it came from the Robbins & Myers acquisition, but I think it's also important to talk about what we're not. We're not a full cycle, all encompassing, artificial lift service provider. We're going to leave that to our customers. What we do have are some really good products, and some strategies for fulfilling some niche needs that we think are unfulfilled today.

If you think about artificial lift through the lens of unconvensionals, you see that if it's an oil well, it goes on some form of artificial lift virtually immediately. More times than not, it's going to be a rod pump. We have one of the leading rod pump wellheads or rod pump BOPs in the market today. The increase that we've seen in hydraulic fracturing has driven some renewed demand for this product, because the operators are now finding that they need to protect their wells from the work that's taking place on adjacent pads. This is leading to the requirement to control higher and higher pressures, and this is a requirement that we're working to fulfill.

NOV also has some of the leading sand management technology in the production space and we use this on a land-based well site. We see a great need to take this technology downhole to protect the artificial lift pumps. This is a need we are working to fulfill today. The well has been drilled, it's been completed, it's now producing, and this where NOV's midstream business comes to life. We actually got into this business after we acquired Robbins & Myers. If it's a dry gas well, then it's got to be transported via pipeline. We have the leading pipeline closure technology in the market and we're working to build a more robust suite of products around this in order to provide our customers a more comprehensive solution. If it's an oily well, a wet well, then it can be transported via pipeline or truck or train. We've kind of noted with interest this year that a very old time technology crude oil pipeline transfer pump has seen a resurgence in demand, the likes of which we have never seen and this product was started in the 40s. As we continue to add other NOV products and technologies and to develop our solutions around this space, this will be a continued area of growth for us.

There are a lot of similarities in the aftermarket between our completion and our production equipment, but there's also a lot of difference. With the exception of our wellheads and our chokes, we typically don't see the same high pressures and high levels of abrasion specific to our wellheads. With over 5,000 in use today and the need for service starting in as little as two years, we have a very fast growing aftermarket



in that product. A high degree of the equipment that we place on the well site is actually used to process the well output. As a result of this, the operator has to know that that equipment is operating as designed or as required. Now production well site is typically unmanned, except for the occasional visit from a pumper. This drives amazing opportunities for remote monitoring and mobile service. Once the operators got his well online, you really can't afford to have it go offline for extended periods of time. Having aftermarket service available when and where needed, as well as having the capability to train our customers' personnel in the operation and maintenance of our equipment, they're both critical keeping the operators' well online and producing.

You can see from this map of the world that within this segment, we have global infrastructure. In a lot of cases, we're already where the unconventional is going. From this footprint, and with this experience, it will be very easy for us to continue to expand where the market takes us in the future to support the needs of our customers.

We've talked about the completion side or really the land based side of our business. Now let's move to offshore production. All the buzz in the market today is about FPSOs. As you're about to see, we have a number of opportunities for the use of our equipment and services in this offshore space. We've selected a spar to discuss some of the offshore production equipment that we manufacture. Now this same equipment would be used on a fixed platform, a TLP, mobile offshore production unit or even an FPSO. We spent the last few years developing this suite of equipment, yet we still have numerous opportunities to expand the breadth and depth of our offering.

Offshore production also creates some very good opportunities for aftermarket service, equipment health checks by our service team, as well as training of our customers, employees in the operation and maintenance of our equipment. I say all this simply to say that for NOV, success in the offshore production space comes in a lot of forms. We were interested to note when we first looked at the video of this top side being lifted, the cranes on this Saipem heavy lift barge were actually manufactured by NOV.

You know we're in the flexible pipe business, but do you also know that we have a proven field development track record for the provision of umbilicals, risers, midwater arches, pipeline in manifolds, mooring systems. We're one of three leading flexible pipe manufacturers in the world with manufacturing facilities strategically located in Denmark and Brazil. In the years to come, we feel that Brazil will account for as much as 50% of the flexible pipe required in the world. We built our reputation on technology, reliability, on-time delivery, and supporting our customers. The development work we have ongoing today for the pre-salt in Brazil, as well as numerous projects around the world, will ensure that we maintain that technology position as the water depths get deeper and the reservoir pressures get higher.

This is the FPSO Athena in the North Sea. The waves were running about 65 foot and the wind was blowing about 65 knots and this FPSO was producing oil and gas as designed. This is an excellent example of a harsh environment application. If it were not for the availability of disconnectable turrets and flexible pipe, placing an FPSO in an environment like this would be challenging at best, very possibly couldn't happen. NOV is the only manufacturer today that manufactures both flexible pipe and disconnectable turrets.

On the preceding video, you saw the type of environment for which you would really need a disconnectable turret for. What we're going to show you here is the actual sea trial of a turret being dropped during excessives test. There are really three key benefits to having a disconnectable turret. First, in the event of a severe weather event like a hurricane or a typhoon, you can drop the buoy, sail the FPSO out of harm's way, preventing any damage to the vessel, takes the crew out of harm's way, also eliminates any potential environmental issues. When the weather event is over, you can bring the FPSO back and reconnect it with relative ease and go back to producing. Also, throughout the life of the vessel, this allows you to disconnect from the subsea infrastructure without disturbing it, and go back to the shipyard for repairs or upgrades.

The third benefit and a very big benefit today is this allows us to uncouple the schedule for the installation of the buoy from the actual construction schedule of the FPSO. You can have your complete subsea infrastructure ready to go while the FPSO is being completed and brought to location. Our turret mooring technology holds the record for the deepest FPSO mooring in the world. This is the Cascade Chinook Field in the Gulf of Mexico, the turret you saw drop on the preceding video was actually that FPSO.

We've talked about some of our offshore production equipment. Now let's talk about FPSOs, because that's really where it all gets tied together for NOV. In the last five years, there have been 45 FPSOs delivered, there's 37 under construction today. We're not differentiating between newbuilds and conversions. As you've seen, we can provide equipment and we do provide equipment for both. We feel that in the next five years there could be as many as 70 more FPSOs placed on order. This comes from looking at existing products that are being talked about in the market today that we think have the best opportunities for becoming ship-shaped FPSOs. Actual economics are going to determine what these vessels really look like or if they get built.

If you look at the supply chain for global upstream projects, you see that 64% of them are over budget, 73% of them are late. Now these



aren't all FPSOs, but the tying factor here is that they all share the same supply chain. This is where we would get the kit for an FPSO. Earlier this year, Douglas-Westwood said that of the 45 FPSOs that were delivered in the past five years, 30 were late. I've also heard that the other 15 lied. You saw that there is going to be increasing demand on the previous slide. If you look at these delays and these cost overruns, it's not sustainable and in fact, it could prevent the industry from getting a sufficient amount of equipment to provide the world with the oil and gas that it's going to need in the future.

If you look at the supply chain for any given FPSO, you can think back to the supply chain Joe showed you earlier. You can see that for any given project, there are a number of players involved. These players each have their own needs. Sometimes they have competing agendas. They're not in alignment with each other, and the risks aren't necessarily allocated in the proper manner. The result of this is there's just no real opportunity for any type of standardization or industrialization in this process. If you look at just some of these areas, if you're the oil company, well, you care about OpEx and CapEx, and you care about the overall field economics. If a topside owner or operator is involved in the process, well they care about CapEx and OpEx too. In today's environment, one of their bigger concerns is can they even get it financed? How is it going to operate? Could it be redeployed to future opportunity down the road? If you're an engineering house, all you really care about is selling hours and more the merrier. If you're a topside provider, well you're probably dealing with a myriad of companies yourself, so you care greatly about installation, integration, technology and cost. The FPSO strategy can impact each area of this supply chain in a positive manner.

You've heard for two days about the NOV way, that's all the FPSOs strategy really is, it's just a continuation of the NOV way. We started off with individual products, we've built them into more robust solutions and packages, we've designed some of our own offshore production concepts, both floating and fixed. We believe we have the relationships and the expertise to establish those industrial alliances that will be required to take our concepts to fruition. You've seen the strategy, and you've seen the toolbox we're developing to deliver that strategy. Earlier today, Joe gave you a very clear explanation of what we did with a drillship supply chain. That was just another version of the NOV way, possibly the defining example of the NOV way. We know how to do this, we have succeeded with this concept in numerous areas of our business and we can do this again.

As I said, an FPSO is where it all gets tied together for NOV. I like to think of an FPSO as just a floating playground for our business units to place their products and services for the benefit of the customer.

Optimized for the equipment we manufacture. You've seen how we make money in this segment. You've seen what we think the market is going to do, you've seen the toolkit we're developing, you've seen that we have products and strategies in various stages of evolution, lots of opportunity for growth with those, therefore our extremely aggressive view of the market is this.

You've seen a lot of cool things, no doubt you've been dazzled by the animations in the video as I was, but there's three things I want you to take away from this, three things that are important to this segment. We're the most diverse global manufacturer of intervention and stimulation equipment in the world and we leverage this position every day. The NOV way is going to yield numerous opportunities for us to continue with significant growth opportunities for our onshore production equipment. While we explain that the future of FPSOs is blue sky and sunshine, success in the offshore production space for NOV is about so much more than just FPSOs.

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