



## Reliability and Efficiency

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Investor Conference 2014  
TECHNOLOGY RELIABILITY EFFICIENCY INTEGRATION


**Reliability and Efficiency**

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- **Transforming** how we manage assets, materials, and people
- **Transforming** our processes and procedural adherence
- **Transforming** our back-office and supporting functions

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By transforming the way we work we will deliver a step change in reliability and efficiency. Next, we would like to show how we can extract differentiated competitive advantage from transforming our organization across areas, product lines and functions.



The Transformation

**MAKING OUR SIZE A STRENGTH**

**OUR TRANSFORMATION**

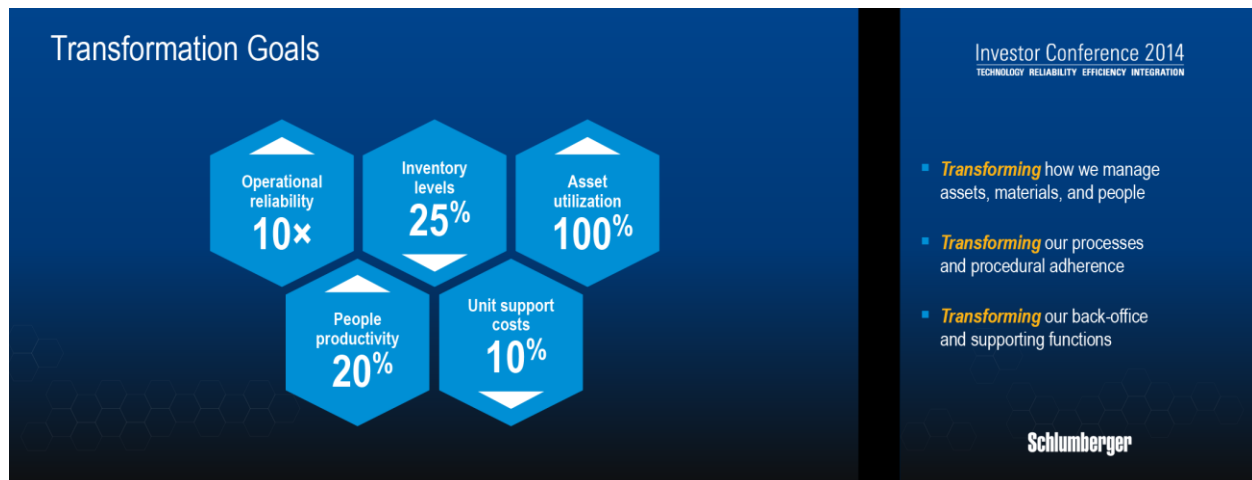
Investor Conference 2014  
TECHNOLOGY RELIABILITY EFFICIENCY INTEGRATION

Transformation

A step change in reliability and efficiency

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Our goal is to deliver a step change in the reliability and efficiency of what we do by transforming how we manage our assets, materials and people as well as transforming our processes, procedural adherence and back-office and support functions.

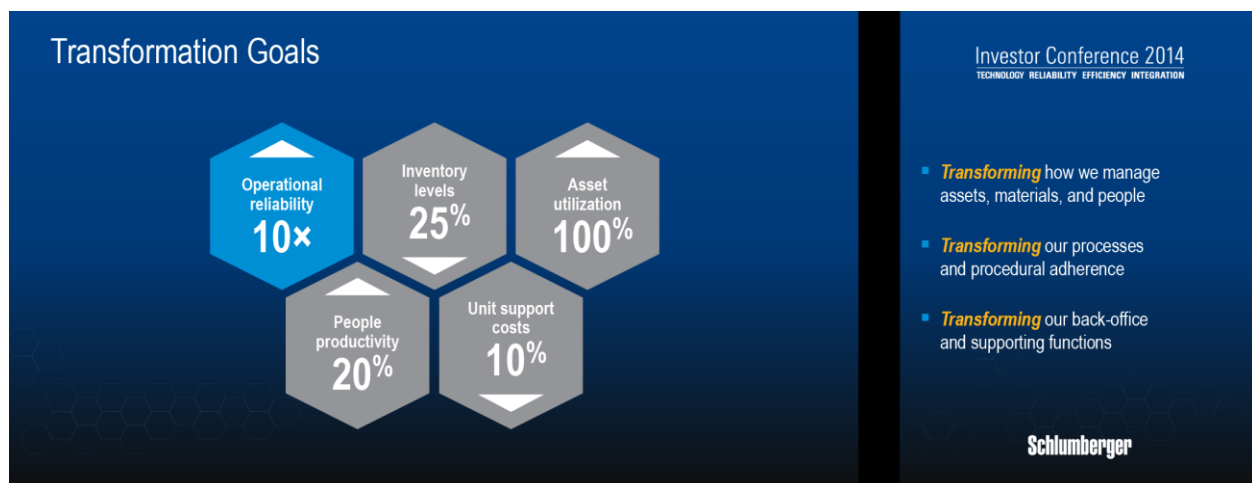


Delivering the step change in the reliability and efficiency translates into a series of performance targets. We aim to increase asset utilization by 100%, reduce inventory by 25%, improve personnel productivity by 20%, improve operational reliability tenfold and reduce unit support costs by 10%.

We're going to show you some elements of our internal transformation program, which will increasingly contribute towards achieving these targets over the coming years. We will focus first on reliability, showing you how the R&E transformation is beginning to impact product performance as well as how we are redesigning our processes and driving procedural adherence by employing best practices from other industries and through the early adoption of supporting technologies.

We will then show you some of the things we are doing to improve how we manage the most capital- and cost-intensive aspects of our business—namely our assets, materials and people. And we will illustrate how the ongoing transformation of our back office and supporting functions is already starting to have an impact on performance.

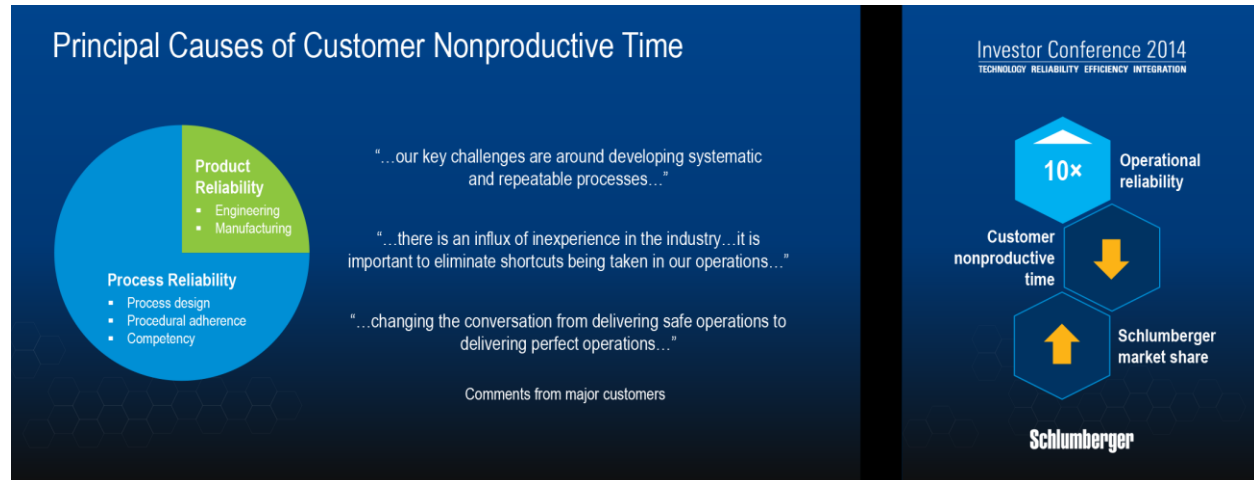
We trust you will gain a clearer insight into how the internal transformation has already contributed to our financial outperformance, and at the same time recognize that the majority of the anticipated impact is yet to be realized.



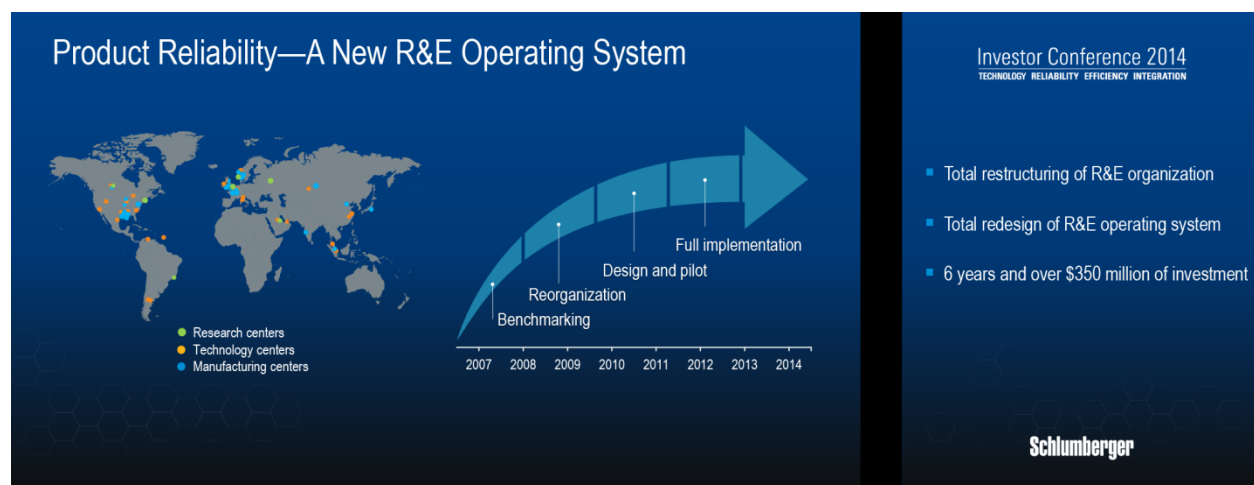


Our goal to transform operational reliability tenfold is very ambitious. However we firmly believe this is of critical importance in transforming the overall performance of our industry, and we know it is a high priority for our customers.

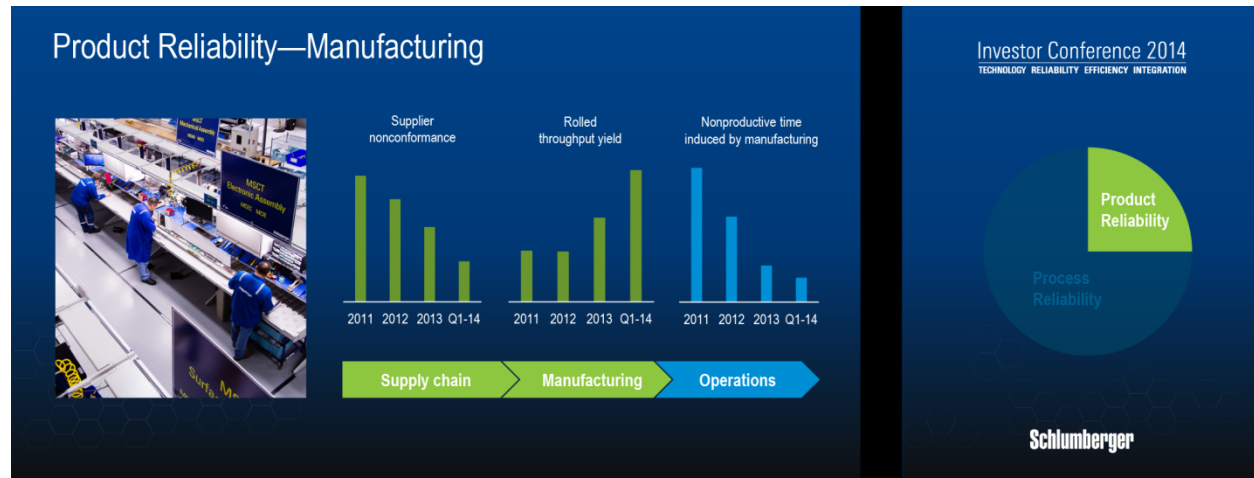
Make no mistake about it. We are the leaders in our sector and are already respected for our execution capabilities and dependability. However when we look at ourselves critically and compare ourselves, and for that matter our industry as a whole, with other high performance industries, we believe that we have room for improvement and that room presents us with another significant opportunity to differentiate ourselves from our competitors.



So, let me take a few minutes to explain our focus on reliability. When we look at the principal causes of customer non-productive time (NPT) there are two major categories. First is product reliability, which is about our engineering, manufacturing, and maintenance practices. Second is process reliability, which is very much about people, how we design our processes, ensure procedural adherence, and assure the competency of our workforce. Product-related issues account for about one quarter of the customer-related NPT attributed to Schlumberger while process-related issues account for the other three quarters.

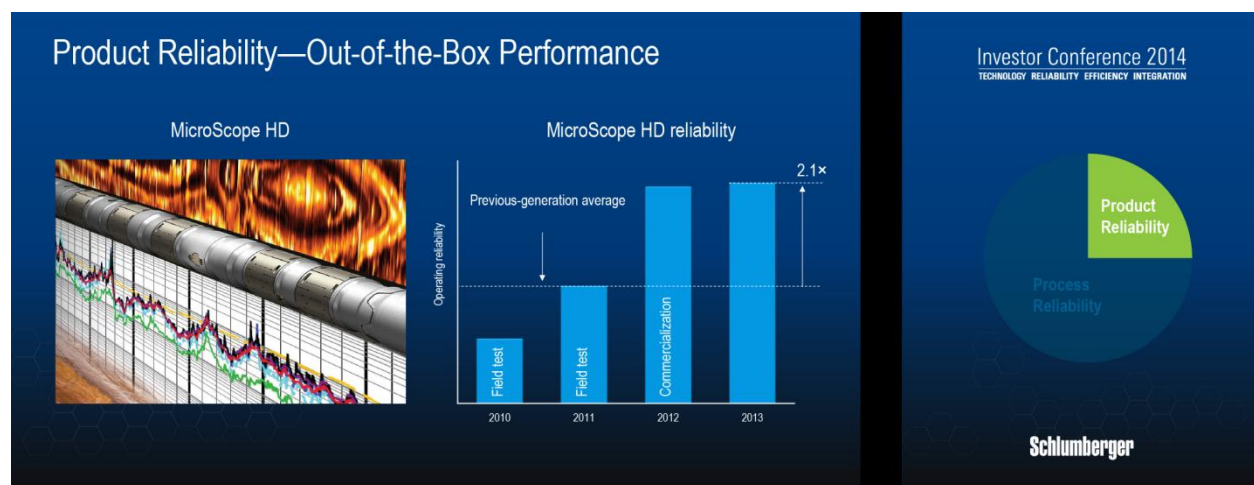


Yesterday we outlined the R&E transformation that was very much focused on raising the reliability of the products produced by our R&E organization. This included a total restructuring of that organization and a complete redesign of the R&E operating system, all of which has taken almost six years and significant investment to put in place.



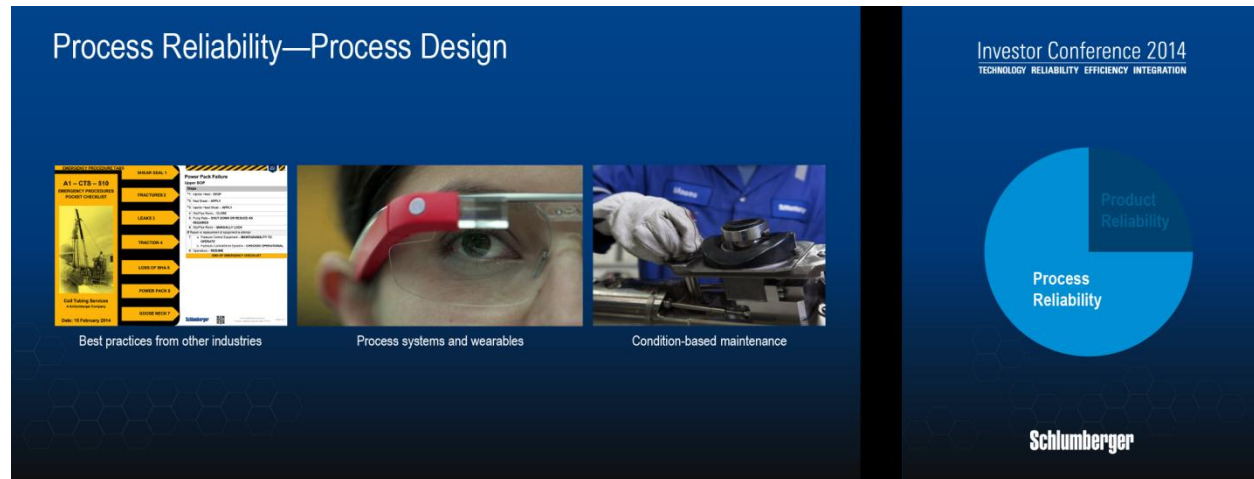
The transformation of manufacturing was a big part of this investment. In tandem with the emphasis on design for reliability and product testing and validation in new products, we have embraced Lean six-sigma production methodologies and reorganized our manufacturing layouts and production flow by adopting best-in-class practices from the automotive and aerospace industries. As a result of these changes, we have seen a substantial improvement in the product quality of our manufacturing plants.

At the same time we have engaged with our suppliers to ensure that they are also part of the reliability improvement drive. This has had a very visible effect on results with a significant reduction of incoming defects, which when combined with shop-floor manufacturing process step-changes has resulted in output yields reaching benchmark levels, and the escape rate of production defects reaching field operations and creating nonproductive time being reduced by a factor of five over the last three years.



The result of this is that we are starting to see new technology introductions in the field with much better out-of-the-box performance. A recent example of this is the MicroScope HD\* high-definition imaging while drilling tool—the latest generation of resistivity imaging technology. When the MicroScope\* service was commercialized in 2012, the out-of-the-box reliability was more than double that of the preceding geoVISION\* technology, despite the fact that geoVISION services had benefited from more than ten years of reliability improvements.

This clearly demonstrates the performance potential of our new R&E operating system when it comes to reliability. We are only just beginning to feel the benefit of this transformation at the field level as it takes time for such radical change to filter through from concept design to tools actually going into a well. This is already starting to have an impact on reducing the green segment of the NPT pie chart and we can extrapolate the impact as more products are delivered through the new system. However if we want to achieve our 10-fold reliability improvement goal, we also need to tackle the root causes of process-related NPT.



Process reliability begins with good process design. And by learning from other industries we are totally re-thinking our approach to designing and managing the critical processes that impact reliability and efficiency the most.

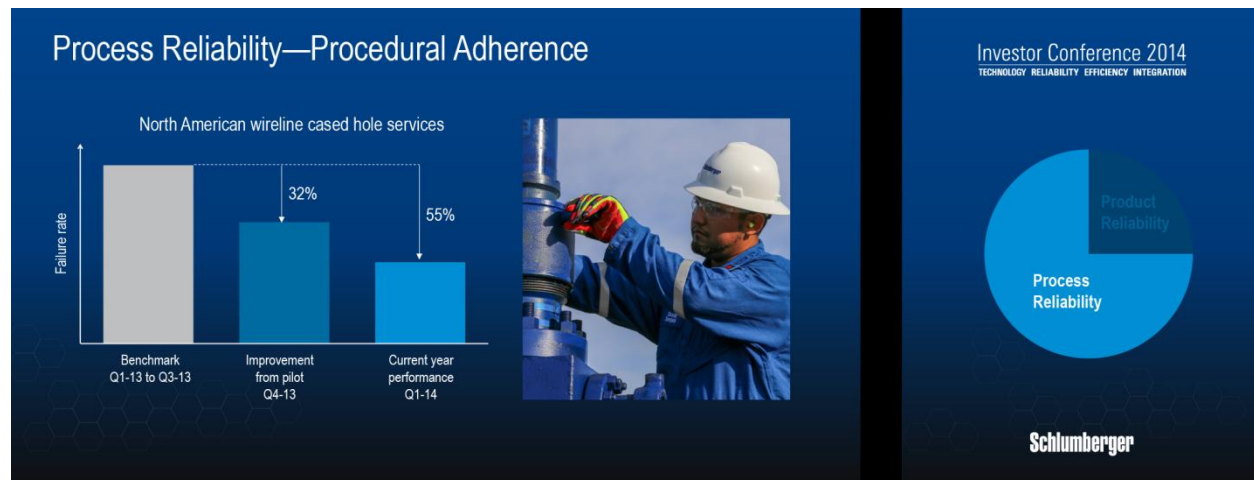
In some cases simple changes can have a big impact. For example we are taking a fresh look at our standard work instructions and our operational checklists, using techniques that have proven highly effective in the world of aviation. If a US air force pilot picked up this coiled tubing drilling emergency response manual it would look very familiar to them because it is an identical design and includes all of the same features.

Beyond this, we have started to take the upgraded standard work instructions and embed them in process management applications. This way, process steps can be rigorously monitored to ensure proper completion and to measure efficiency. End user feedback and suggestions for improvement can be captured in real time, and consolidated data can be used to identify bottlenecks or reliability concerns so that they can be addressed. And any changes to these standard work instructions can be immediately deployed and accessible to all users, globally and in real-time.

Use of new technologies will further enable our employees to make the most of this new way of working. We are working in close collaboration with leading academic institutions as well as technology partners, such as Google, to optimize process workflows, leveraging technology as well as the latest learning systems and simulation. Our partnership around the applications of Google Glass is a good example of this. This illustrates one of those potential applications, showing how our field maintenance organization will function in the not too distant future.

Imagine that, even in the remotest of locations, the user could have access to critical knowledge, be it a tool diagram, a set of instructions, a how-to-do-it video, or even real-time connection to an expert located somewhere else in the world while maintaining full mobility and both hands free for the task at hand. Just a few years ago this would have sounded like science-fiction, now we are not far away from bringing it to our real world.

A lot of our initial focus has been on equipment maintenance because this is on the critical path of service delivery and there are many aspects of maintenance that benefit from improved process design. Once again, we have looked to leverage best practices from other industries, moving maintenance from a traditional fixed-schedule approach to condition-based maintenance in which maintenance is performed on an as-needed basis—as derived from condition sensors in the equipment as well as exposure data related to the operating environment it was used in. We have been testing this approach for over two years now and there have been some excellent results. For example the MDT\* platform—the workhorse of Wireline reservoir sampling & testing—has more than doubled in reliability over the past three years. This is equivalent to eliminating over 200 MDT operating failures for our customers in 2014.

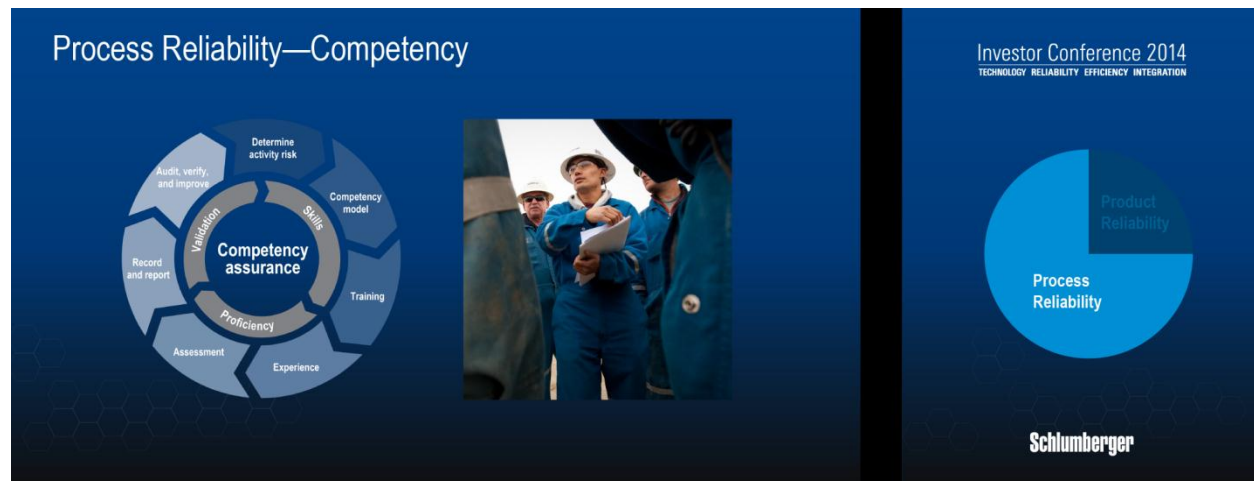




While systems and technology can provide the foundations for reliability and efficiency, it is at the end of the day the behavior and actions of our employees that really make the difference.

Schlumberger is already a leader in our industry with respect to procedural adherence. This is after all a key element of our culture that is embedded from our first day of induction into the company. But we can still do better here in two ways. First by again adopting good ideas from other industries, for example the rigorous do-confirm methodology that are standard practice between pilots and co-pilots; and second by reinforcing our focus on procedural adherence across all operations to bring every product line up to the same level of performance.

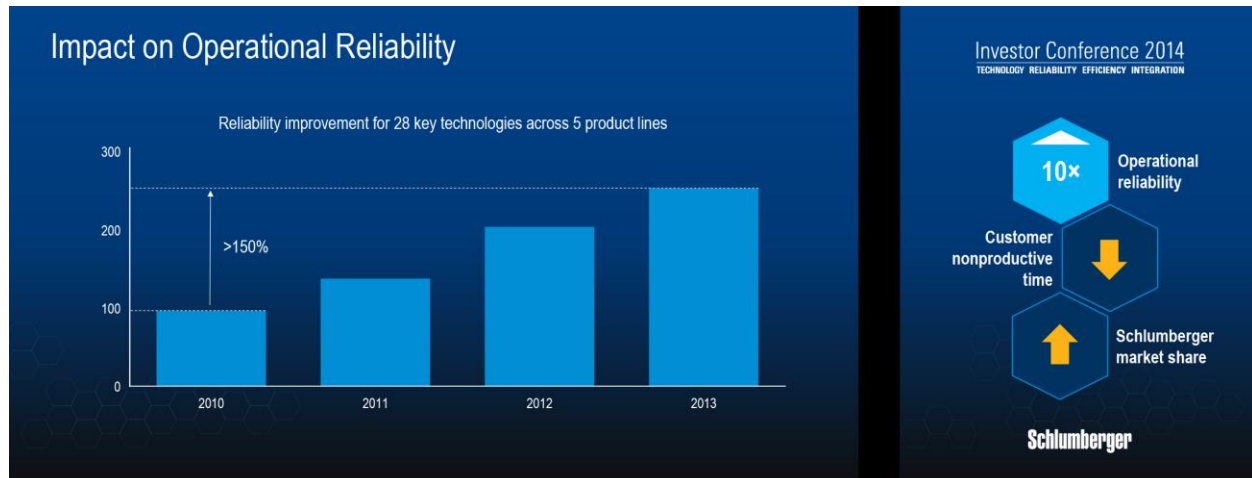
When we conducted a trial of this recently with our North American perforating operations, we achieved a step change in service reliability—reducing their rate of misruns by over 50% in the space of only a few months. What is more, we have found that our employees respond positively to such initiatives and take pride in delivering even stronger performance for our customers.



Processes are of course important, but you also have to be sure that they are being used by competent people. Traditionally the industry has determined competence by looking at training records and the number of years of experience. Going forward, this is going to have to change because of multiple factors. First, with the projected growth there are simply not going to be enough collective years of experience available in the industry as a whole. Second, the gap will be exacerbated by demographics and the much talked about crew change. Third, the technology is evolving and it is not obvious that the older generations adapt best. And finally, years of service are actually no guarantee of relevant experience.

For all these reasons, we have to change to a model that ensures that we develop people with an assured combination of skills and proficiency level, independent of their years of service. We have long been respected for having the best-in-class training and development programs. We have however recognized the opportunity of taking a more systematic approach to complement skills development with a more rigorous way of developing and validating proficiency. By doing so, we believe that more formal assurance of the crew competency that is being called for by both internal and external stakeholders in the post-Macondo world.

In line with this, we have developed a standard competency management framework that is currently being deployed through the product lines.



All of these reliability-focused initiatives will combine to give us the step change in performance we are aiming for over the coming years. Since 2010 we have been tracking 28 key technologies that have benefited from some of these new practices. The average reliability among this group of technologies has already increased by more than 250%.

A lot of this has come so far from product reliability gains, through the R&E transformation and the introduction of condition-based maintenance. Going forward, this improvement trend is set to continue and will be increasingly driven by the process-related transformations we have just described.

I am therefore confident in predicting that the reliability leadership for which Schlumberger is already recognized is heading to a new, higher level, which will benefit directly our customers and increase the value of our differentiated offering.

Let's now move on to the transformation goals we have set relating to operational efficiency.



Our inventory today stands close to \$5 billion. Even a small improvement in how we manage a global inventory of this magnitude can have a material impact on financial results. The good news is we have significant potential to improve through the adoption of methodologies and tools that have already been proven and perfected in other sectors.



From the very beginning of the matrix structure in 1998, we established some consolidation of logistics and distribution processes and organization across our product lines. Each product line, however, continued to manage inventory the way they had always done.

The conventional approach was for operating locations to look at their planned activity and to order sufficient products and materials, which would then be shipped and stored locally until needed. Each location managed their inventory independently of each other, holding a sufficient buffer to cover for uncertainties in operational activities and supply lead times.

As the size and number of product lines has grown over the past decade, this approach has led to substantial financial inventory distributed very widely across the world. Analyzing how this inventory was traditionally consumed raises some interesting trends.

First, looking at product inventory which we hold on the balance sheet, our remote and challenging logistical environments require high levels of contingency stocks but there is still a significant prize available if we rethink the status quo.

And second, looking at materials and spares which are expensed, in some product lines as much as 90% of spares remained on-hand in stores for more than six months before they were consumed.



Recognizing that this situation is far from being the optimum, we began to look at new ways of managing inventory. We raised the responsibility for demand planning above the operating locations to the regional level and consolidated the number of physical stores we have today, bringing the management of all this under the ownership of Regional Distribution Centers.

These centers allow us to decrease stock by aggregating demand, reducing slow-moving parts and obsolescence through better sharing and reducing lead time (and lead time uncertainty) as well as by better planning and proximity.

Today, we have almost completed this transformation in North America and for parts of the Middle East and we are already seeing the benefits in these regions. Over the coming years we will transition to this more efficient way of managing inventory on a global scale.



Our approach to transforming asset utilization is in principle the same as that for inventory, we are moving from a decentralized model where decisions are focused at the location level to a hub-and-spoke model where resourcing decisions are consolidated at a regional level. The difference with assets is that we are dealing directly with the equipment and tools used to deliver services for our customers. These need to be properly maintained and appropriately configured for the specific



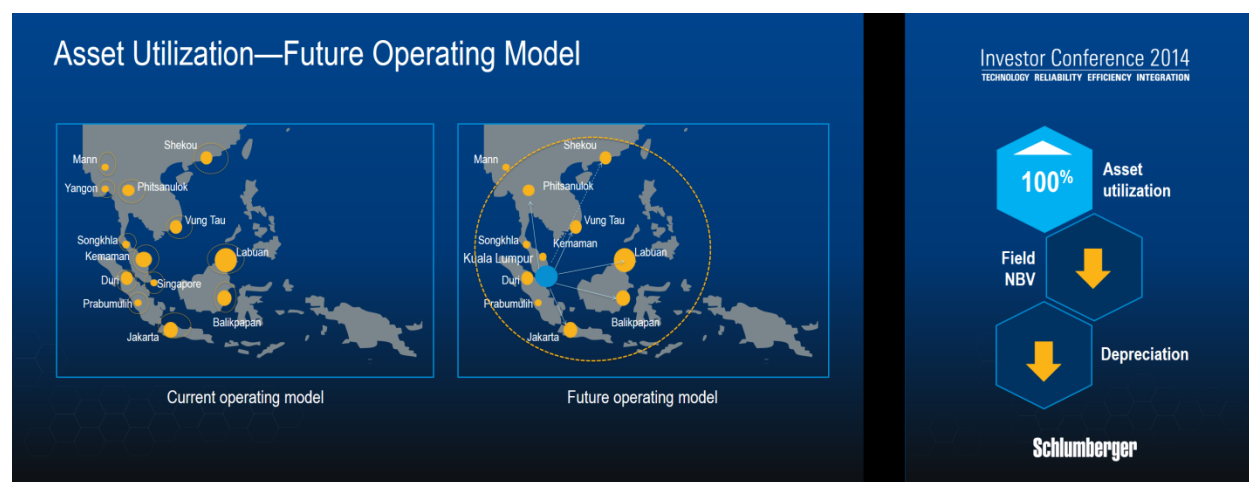
operating environment. We do not hold surplus stock of downhole tools in stores, and we have to be able to respond quickly to changing customer needs.



Transforming asset utilization therefore represents a very different set of challenges to that of product and materials inventory. The upside potential, however, is equally large. This again stems from our historical approach to asset management and the Wireline Product Line is a good example of this. The Wireline operating model was originally based on what was known as the cell concept, a self-sufficient unit which included an engineer with crew, logging unit and downhole tools, all of which remained together and moved from job to job across an operating location.

While this concept has evolved, the basic principle has remained the same and today the operating locations maintain control of a dedicated fleet of tools that they use exclusively. Taking East Asia as an example, it has 13 locations which work pretty much independently of each other. Each location holds onto their assets to ensure they maintain a sufficient buffer of equipment to cover their activity peaks.

When we look at how much time these assets are being deployed to work for our customers we find that the numbers are low. In fact the assets in East Asia locations were on average idle for over 40% of the time, depending on activity levels. And when you look at the percentage of time spent by wireline tools actually logging wells, the number is less than 10%. This is like an airline where the aircraft are only flying for 1 day in 10. Our Wireline business globally has healthy financial results and has historically never really challenged itself to improve on these numbers. That was until last year.



Since August 2013, Wireline have been piloting a regional approach to asset management, changing from the current decentralized operating model to one in which where assets are managed regionally.

As part of this pilot, Wireline established a Center for Reliability and Efficiency in Port Klang, Malaysia, where Wireline tools are maintained and prepared for distribution to jobs across three GeoMarkets: Malaysia, Thailand and Vietnam. A central team looks at activity demand across all of the locations and deploys assets accordingly.

In the first few months of operation, asset utilization has already increased significantly. As a result, almost 30% of the asset fleet has been freed up during the first quarter this year, redistributing the spare equipment to other locations and lowering their capex needs for 2014. Another benefit is the centralization of maintenance expertise that has helped to improve fleet reliability and reduce time associated with tool maintenance.

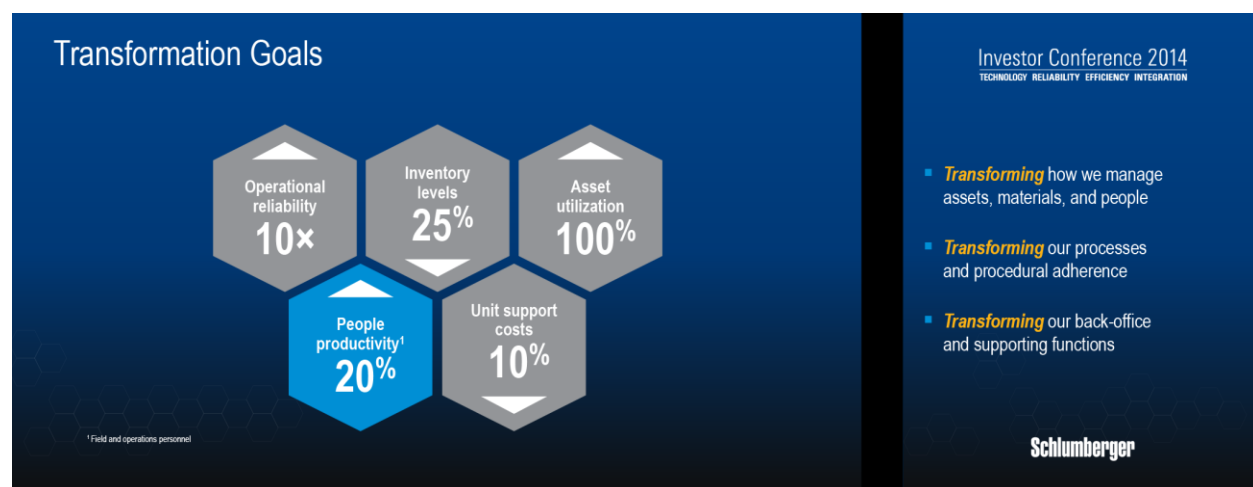
With such positive results, Wireline has already started to expand this pilot to neighboring GeoMarkets in China, Australia and Indonesia. As they learn more and improve their processes, we expect further gains in 2014 and beyond.



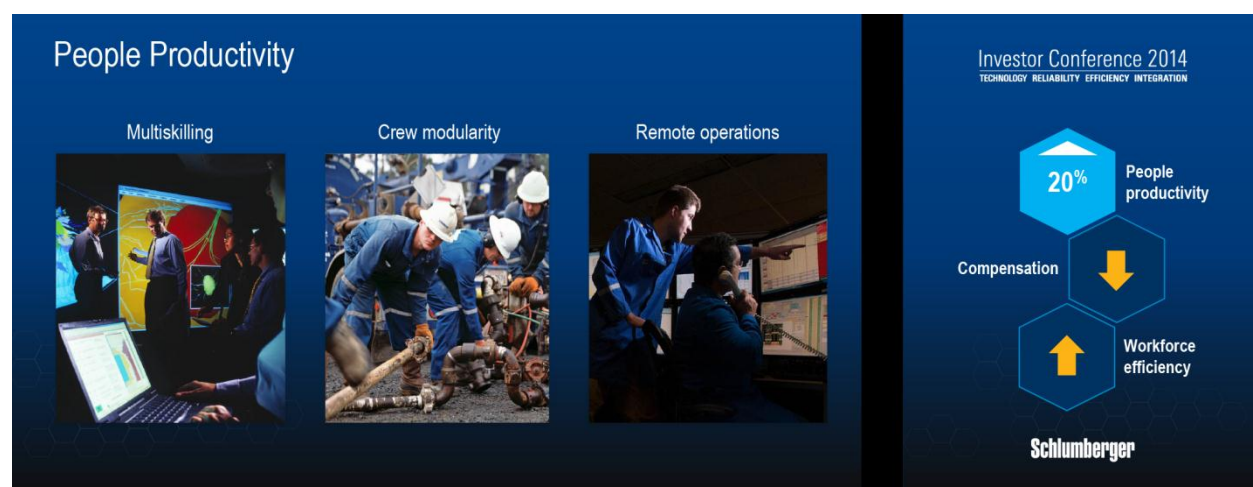
Looking beyond the Wireline example, we see similar potential across all asset-intensive product lines, where today even the best performing ones have less than 30% average utilization. We are therefore very confident of our ability to double average utilization across the company over the coming years as we scale up globally and across all product lines.

In terms of capex, this will permit us to reduce annual spend as we re-deploy our existing fleet to cover future growth. This is already taking place, with 2013 actual and 2014 planned capex representing 8-10% of revenue compared to a long-standing baseline of 12-13% in previous years.

As this new way of working gains pace in the coming two to three years we expect to be well on the way to achieving our 100% improvement goal and to have removed a substantial amount of NBV from the balance sheet.



When considering field personnel, the people we send to the customer location to deliver products and services, we can also move from decentralized ownership and decision making to a regional hub-and-spoke model. In addition, there are opportunities for us to transform the deployment model itself, therefore we are developing a number of themes related to people productivity.



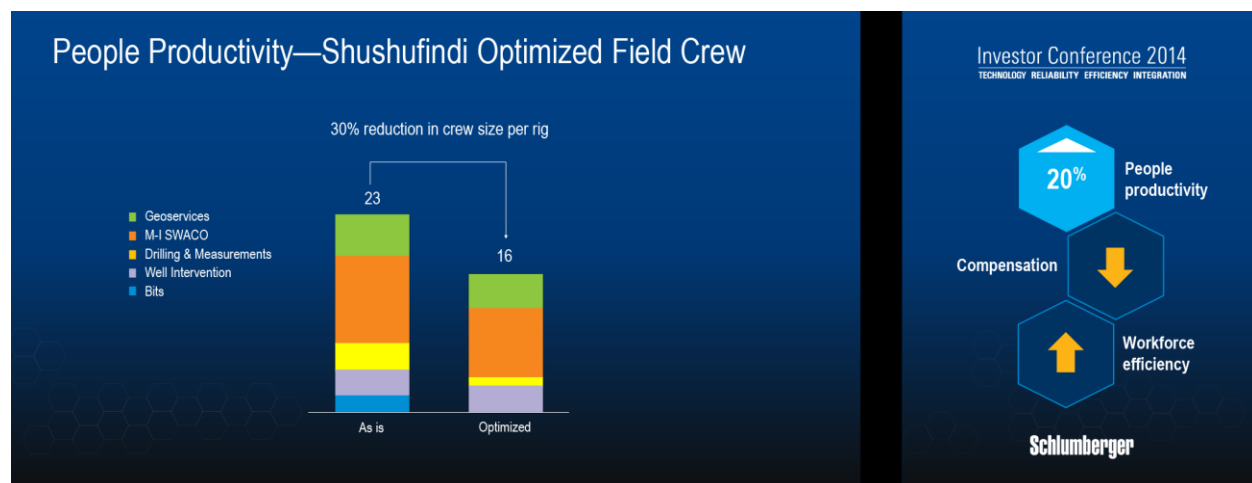
Three of these themes are multiskilling, crew modularity and remote operations.

Multiskilling looks at the traditional roles performed by personnel at the wellsite and operating environment and identifies more effective ways to assign responsibilities across the entire operational workflow. Multiskilling is particularly effective for breaking down the conventional barriers between product lines, and for optimizing crew size on integrated projects as you heard yesterday.

Crew modularity is associated with high-volume operations on land and re-defines the wellsite crews into specialized units, such as rig-up and rig-down crews. By moving these modular crews from job to job, we significantly increase productivity and also ensure more consistent service delivery.

Remote operations uses wellsite IT capabilities to connect the rig in real time to expertise and support in the base. The remote operations concept has already existed for about a decade, but we are only just beginning to see wider applications as the IT and operational challenges have been overcome. The concept not only reduces the need for personnel at the wellsite, but also has a proven impact on reliability through the much more effective sharing of knowledge and expertise across multiple operations in real time.

Each of these themes can be applied individually to reduce the total number of people required to cover a specific job. This has a positive impact on operating efficiency for Schlumberger, and is very important for our customers who also want to reduce personnel and HSE exposure at the wellsite. We are already making progress in several product lines that are adopting these new ways of working into their deployment models. For example, Drilling & Measurements has deployed remote operations extensively, and has reduced the average field crew per job by over 10% since 2011.



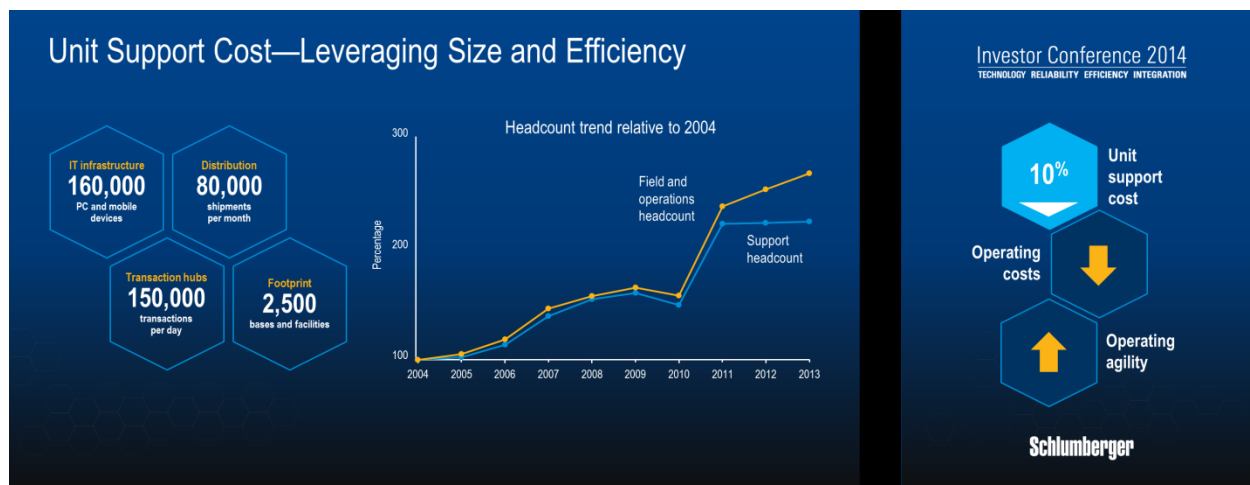
In combining these themes across product lines on integrated projects, the greatest impact on productivity can be achieved. We have proven this on projects like Shushufindi in Ecuador where we developed an integrated approach to people productivity during the planning phase for this production management project. We deployed multiskilling, remote operations and optimized roles to reduce the wellsite crew from 23 down to 16 personnel, a reduction of over 30%. This will deliver a major productivity gain as we expand these themes and this way of working to all suitable projects.



Improving the productivity of our field personnel translates directly into an increased capacity to cover more work with the same number of people. As a result, in 2013 we increased our field population by 700 fewer people than would historically have been required to fuel growth. And this was with only very preliminary deployment of the transformation themes.



We have now looked at our plans for transforming how we manage resources and people as well as how we will leverage our processes and procedural adherence to take us to the next level of reliability and efficiency. The third element to consider is our support platform—those functions and back-office transactions that underpin all of our operations. Again we are undertaking a complete transformation of this platform to drive efficiency and reliability still further.



This phase of the transformation includes a complete upgrade of our IT infrastructure, consolidation and rationalization of our facilities, and a number of initiatives across sourcing and procurement, logistics and distribution, finance and human resources transactional activities—all of which focus on leveraging our size. Collectively, these initiatives will translate into significant savings in our operating costs per unit activity.

One proof-point of this is our support headcount. If we divide our workforce into two broad populations—operations direct, the employees who are directly involved in delivering products and services for our customers—and operations support, everyone else engaged in supporting the product and service delivery process—the two populations have grown directly in proportion to each other for the past decade.

In 2011, as we started to implement the earliest initiatives of the transformation program, we began to see a divergence in this trend with our operations support population holding flat despite continued growth in the operations-direct employees needed to sustain activity growth. Our improvements in process efficiency and support platform have enabled this stabilization of the operations support population and will do so with increasing effect in future as each initiative of the transformation is deployed. Translating this trend into headcount, we estimate that in 2013 our operations support population numbered some 3,500 employees less than it would have been had the pre-2011 trend continued.



The goals of the transformation program are far reaching and ambitious. Managing this change is a priority for the entire leadership team of Schlumberger and as you saw at the start, all of us here are passionate about the topic and we are confident that we will deliver.

We know how to drive internal transformations because we have a history of doing it. In the past, we took a conscious decision to transform our workforce and today we have the most diverse and culturally strong group of people compared to just about any other company we know of.

In 1998, we decided to transform our organization into a matrix structure to support greater customer focus and integration. This was an immensely complex challenge, and it took us many years to perfect it into the major strength that it is for Schlumberger today.

This next transformation will be equally as important and effective for maintaining and extending the outperformance and leadership of Schlumberger for many years to come.

Thank you.