

# BENCHMARKBRIEFINGS

**kardex**remstar

## SITE

National Oilwell Varco  
Houston, TX

## APPLICATION

Fulfilling Parts Orders for Manufacturing

## EQUIPMENT

Three Shuttle® Vertical Lift Modules with Pick-to-Light Technology

## SUMMARY

Picking manufacturing orders 44% faster using less labor while recovering 70% of previously occupied space

"We are now averaging 1.85 minutes per pick from the Shuttle VLMs compared to the 4.72 minutes per pick from the shelving."



## Shuttle VLMs Help Meet Lean Objectives by Increasing Productivity 44% and Reducing Labor in 70% Less Floor Space

National Oilwell Varco prides themselves on delivering unlimited customer solutions by creating exactly what the customer needs when they need it. Along with custom jobs, comes custom parts, which would make a normal warehouse a pretty crowded place, but not at National Oilwell Varco's Sam Houston Parkway Facility (SHP).

National Oilwell Varco is a leading provider to the oil and gas industry and is dedicated to providing the highest quality oilfield products and services. For more than 140 years, National Oilwell Varco has been providing customers everything from spare parts to comprehensive drilling systems; including rig equipment, integrated systems, downhole tools and supply chain solutions.

As plant capacity increased at the National Oilwell Varco-SHP Facility, so did the number of parts. Committed to continually improving their customer's performance by implementing the Lean 5S program (Sort, Set in order, Shine, Standardize, and Sustain), the National Oilwell Varco-SHP Facility began to focus on improving their warehouse operations. The warehouse supplies parts to the manufacturing floor and keeping it organized and stocked with the right parts was becoming a challenge.

The warehouse was redesigned to include three Shuttle Vertical Lift Modules (VLMs) from Kardex Remstar. The National Oilwell Varco-SHP Facility is now picking orders 44% faster using less labor while recovering 70% of previously occupied shelving space.

### Timing is Everything

"Before installing the VLMs, we did a time study. Workers were averaging 4.72 minutes per pick and we knew we needed to

decrease that," said Brenda Esman, Warehouse Manager. Now, about half of the parts for an order are picked from the Shuttle VLMs and the other half from the shelving. The Shuttle VLMs average 1.85 minutes per pick, and because parts were able to be relocated to more accessible shelves, the shelving time has been reduced to 3.43 minutes per pick. Esman continues, "Our average picking time has been reduced to 2.64, that's a 44% increase in productivity."

### Flexibility in Labor

On average, the new system requires two people, one to pick from shelving and one to pick from the VLMs. "When order volume is high, usually near the end of the month, we have the flexibility to add an additional person to the shelving area to keep up with the VLM area," said Esman. With the previous system requiring eleven people being responsible for all transactions, SHP has cut their department labor requirements to eight people while remaining flexible to adjust labor to meet order volume.

### Increasing Density

The warehouse is responsible for about half of the 18,000 parts in National Oilwell Varco-SHP Facility. With about 3,000 of those parts in the Shuttle VLMs already, the goal is to get all of the high usage parts (about 5,000 parts) into the VLMs. "As we move more parts into the VLMs and a greater percentage of parts for an order are picked from the VLMs we expect to see the productivity numbers increase even more," says Esman.

The parts that have been relocated to the Shuttle VLMs occupied 2,654 square feet of floor space when previously stored in shelving. The new Shuttle VLMs occupy only 797 square feet; opening up 70% (or 1,857 square feet) of shelving space. "We



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chose to leave a portion of the shelving in place and were able to move parts that were previously stored outside and prone to damage onto shelving inside," says Esman.

With the rest of the recovered space, they were able to relocate the staging area into the warehouse area, making delivering completed orders from the shelving or VLM area much quicker. "The recovered space has allowed us to create a safer work environment for our employees, getting parts and trip hazards off the floor and clearing the remaining shelving aisles," says Esman.

## Delivering Parts to the Worker

Using the Shuttle VLMs all parts are automatically brought directly to the operator eliminating walking, climbing and stooping to retrieve parts. Workers no longer push carts, repetitively move and climb stairs or reach under shelving into dark corners. Every part is presented to the VLM operator on a tray delivered at an ergonomic height to a clean and fully lit workstation.

Further, the VLMs are equipped with Transaction Information Center (TiC) lights that direct the operator to the exact location of the part, displaying the quantity to pick and part number. The worker no longer spends time matching the pick list to the part number, now an operator is guided by the TiC to the correct location and they simply pick the part, increasing pick accuracy and productivity.

## Looking Back

Before redesigning the warehouse all parts were stored on standard rack and shelving that was 20 feet tall. Warehouse workers would grab a paper pick ticket from a stack and with a work cart they would walk up and down the aisles collecting the parts required for an order. After climbing up and down ladders and searching through shelving locations the completed order was brought to a staging area adjacent to the warehouse and held for pickup by the requestor.

## Speeding Things Up

A warehouse coordinator prioritizes the work orders by their requested date and prints labels for each part within a work order. The labels for parts required out of shelving along with a pick list are delivered to the shelving area to be manually picked and then brought to the staging area. The labels for parts required out of the VLMs are delivered to the warehouse Shuttle VLM area.

When the VLM operator receives the labels for a work order that is their indication the order is ready to be picked. The operator pulls the order file from a shared network and imports it into the FastPic IC software that drives the VLMs.

With the click of a button the VLMs start to move, retrieving parts to deliver to the operator. The part is delivered to the workstation and the TiC displays where and what to pick. The operator picks the part, bags it and tags it with the preprinted label. The operator moves back and forth between the three VLMs with little dwell time until all of the parts required for the order have been picked.

The VLM operator then places the parts for the order to the work cart located in the staging area to be matched with the parts required from shelving. When the order is complete, manufacturing is notified and they retrieve the order from the warehouse staging area.

## Leaning Toward 5S

Along with the implementation of the Shuttle VLMs National Oilwell Varco-SHP Facility integrated a Lean 5S program into the warehouse. The program is based on continual improvement and focuses on visual order, organization, cleanliness and standardization.

The 5S program stands for sort (determine what is really needed), set in order (arranging items in the work area for efficiency), sweep (cleaning and maintaining the area), standardize (create processes and procedures) and sustain (creating ways to maintain the processes). "The Shuttle VLMs turned out to be a nice compliment to our Lean 5S Program, helping us sort though our parts and organize them for maximum efficiency," said Esman.



SHP has cut their department labor requirements from eleven people to eight people while with the ability to vary labor to meet order volume.