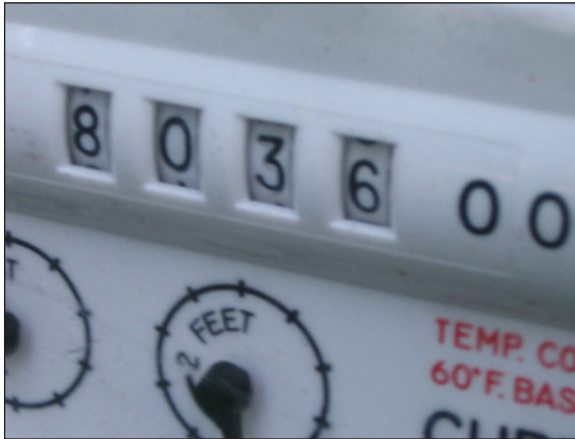


Measuring Up: Dominion Proves Accuracy with Minitab Statistical Software



Faced with new regulations that would have cost millions of dollars, Dominion trusted Minitab Statistical Software to perform the data analysis required to demonstrate to the utility commission that its remote meter reading equipment was accurate.

KEY FACTS

ORGANIZATION

Dominion Resources

OVERVIEW

- Headquartered in Richmond, Va.
- Serves retail energy customers in 12 states
- 18,000 employees

QUALITY CHALLENGE

Overcome regulatory assumption that remote meter reading devices weren't accurate.

PRODUCTS USED

Minitab® Statistical Software

RESULTS

- Reduced costs by more than \$7.8 million over two years
- Minimized disruption to customers
- Reduced employee safety incidents

One of the largest energy producers in the U.S., Dominion Resources serves people in 12 states. In Ohio, its Dominion East Ohio company delivers natural gas to 1.2 million customers. Remote systems on about 370,000 meters let Dominion take readings without requiring a technician to make a house visit, but the company faced complications—and tremendous expenses—when the Public Utilities Commission of Ohio (PUCO) decided in 2008 that remote readings would not be considered as actual readings. Dominion would thus fail to meet requirements that companies read meters at least once a year. Dominion was confident its equipment was indeed reliable, so Six Sigma Black Belt Tim Andrews led a project to prove it, racing against the imminent regulatory deadlines. “We needed to demonstrate conclusively that our remote devices are as accurate as reading the actual meter,” he says. About \$8 to \$12 million in cost savings depended on it, but even more important factors also were on the line. “The confidence of our customers was at stake. This project would also prove that the technology we used to bill them was accurate.”

The Challenge

About 43% of Dominion's gas customers had meters located inside their homes; of those, 29% were equipped with remote readers. Dominion estimated that obtaining actual meter readings from all meters, including those equipped with remote readers, would cost between \$8 and \$12 million yearly, in addition to inconveniencing customers who would need to be on hand when readings were taken.

The requirement also would hamper an effort to improve meter accuracy that was already under way. Dominion had embarked on a project to install new automated meter reader (AMR) technology on all meters by 2011.

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In use throughout the United States, these devices use computerized technology to transmit gas usage information to company vehicles driving through neighborhoods.

How Minitab Helped

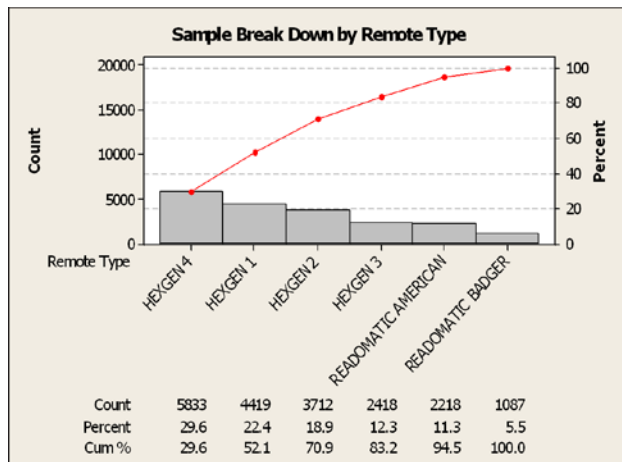
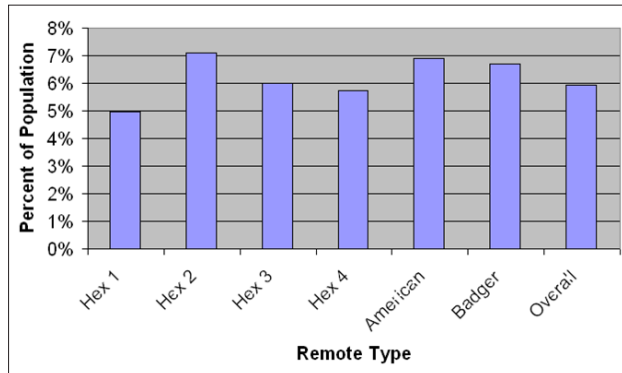
Dominion has a wealth of experience in using data and statistics to improve and demonstrate quality. In 2001 they became the first energy company to launch Six Sigma companywide. To date, Dominion has trained more than 500 Black Belts and Master Black Belts and more than 900 Green Belts.

Andrews and his team used Minitab Statistical Software's ability to analyze data from a sample to make inferences about the total population with high levels of confidence. They analyzed data collected from 19,704 records, or 5.9% of the installed population. This data included both the remote and the actual meter readings collected from accounts between January 2005 and July 2006. Among the analyses they used was a 1 proportion test to prove the remote readings were accurate. Using Minitab's Power and Sample Size tool, they further determined the size of their sample permitted the team to make estimates with an unusually high 99% confidence interval. "That really helped us make our case to the commission," Andrews says.

The team found that the overwhelming majority of remote readings—13,454 records—were exact matches for the actual meter reading. Slightly less than 1,000 were within ± 1 Mcf, while 737 were within ± 3 Mcf of the actual reading. "Minitab's analysis helped us prove that our remote reading devices were accurate," says Andrews. "We found our Hexagram remote devices had a 1.8% defect rate, while the Read-O-Matic remote devices had a 9.5% to 21.4% defect rate." That sounds high—until you realize the overall defect rate accumulated over the life of the device, which ranged between 15 and almost 30 years. "In short, our remote devices were accurate, and we proved it with Minitab."

Results

Andrews' team recommended that Dominion ask PUCO for a waiver on the requirement to obtain actual meter readings from in-home meters that were equipped with remote reading devices. PUCO granted the waiver, with stipulations: Within 5 years, all Hexagram devices needed to be replaced with AMR devices; Read-O-Matic remotes needed to be replaced within 2 years; and AMR devices also were to be installed on all other meters—as Dominion was already doing. The waiver means fewer customers need to disrupt their schedules to accommodate in-home meter readings. Dominion also has seen reductions in employee safety incidents. The waiver avoided costs by approximately \$7.8 million. It also enabled Dominion to devote more resources to installing AMRs. Dominion has installed them on nearly 53% of all of their meters in Ohio, and has removed the Read-O-Matic meters from active accounts. In addition, customers have increased confidence in the accuracy of their bills.



Dominion was able to demonstrate the accuracy of their remote meter readers to the utilities commission with absolute confidence by analyzing their data with Minitab Statistical Software. The graphs above helped demonstrate that all the types of remote readers Dominion used were adequately represented in their sample.



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