Getting Down to Performance Specifics, Revving Up Competitiveness at Rubbermaid, Cleburne, TX

They're striving to be "simply the best."

Lea A.P. Tonkin

Just how many more times can you find ways to improve repetitive production processes for something as common as plastic storage totes, after your first whack at trimming the fat? When you're working at Rubbermaid in Cleburne, TX, you set and achieve stretch goals yearly, monthly, and daily. Then you give it another shot. If you're serious about staying in the game with customers such as mass marketers Wal-Mart, Target, and Kmart, you sharpen your strategic focus on overall improvement objectives and then bring it on home to all areas of the operation and every employee in each day's work. And you back it up with well-designed critical performance measures.

"Every year we sell essentially the same product," said David Nelsen, director of manufacturing for three Rubbermaid plants including Cleburne and Greenville, TX and Goodyear, AZ. "If we don't learn to improve faster, our costs will escalate and our business will fail. We have

About Rubbermaid, Cleburne, TX

Part of Newell Rubbermaid's Home Products Division (HPD), the Rubbermaid plant in Cleburne, TX near Dallas/Ft. Worth sold approximately $59 million worth of plastic storage totes and other household containers during 1999. Performance improvements helped the plant reach a new shipping record of $12.1 million in December 1999, compared to its previous $8.5 million record.

The facility employs 350 associates and 39 injection machines. Cleburne has 34 exempt/non-exempt associates, the same number as when the plant ran at a 20-machine level five years ago.

The Kaizen concept powers improvement processes here. Manufacturing is divided into five cells: Gold, Blue, Green, and Red, each with seven machines; and Burgundy, with 12 machines.

World-class concepts, outlined in Cleburne's quality policy and key initiatives documents, spark competitiveness improvements. Associates in technical, manufacturing, and distribution departments mark their progress for each shift in safety; housekeeping; labor; run time, scrap, cycle time; rework; customer service levels (on time orders shipped to the customer, line fill (how many lines on a total order were filled), and order complete (how many orders were shipped complete). TPM (total preventive maintenance) is a big part of Cleburne's success, involving associates with duties ranging from machine to mold and forklift responsibilities.

The Cleburne operation was ISO 9002 certified in October 1997 to drive standardization and will continue to operate under ISO principles, according to L.B. Ward, operations manager.

a compelling reason to reduce our costs and practice continuous improvement.

"We have a yearly process of developing a one-page summary of our mission, and our quality philosophy," Nelsen continued. "The entire management team is involved in the process. We select several major operational excellence initiatives such as customer satisfaction to focus on for the next year. (See Figure 1.) What we're asking ourselves is, 'What are we going to do to make ourselves significantly better?' The entire management team is involved in this process of picking our shots — rifle shot targets. If you try to do a hundred things well, you won't do well in most of them.

"Then we look at ways to achieve these targets, with monthly and quarterly reviews. The biggest focus is on the customer. A big portion of our business is repetitive — Rubbermaid totes, etc. One of our key areas for this year is to manage our resource load more effectively," Nelsen said. "We have peaks and valleys in our business. We don't just look at capacity requirements and open capacity a week ahead, but a month or two ahead. We look for ways to bring in business from other plants, to fill in the valleys." Higher machine availability through TPM, better use of automation, and ongoing cell/work team empowerment and training activities also claim ongoing attention.

"We refer to kaizen as a continuous improvement (CI) process — our vehicle of change. For example, when we made the change to cellular manufacturing, we used kaizen to make that change," Nelsen said. Selected "lessons learned" at Cleburne were shared by Nelsen and others at Cleburne.

Cleburne Operation Mission

Mission:
The Cleburne Operations will deliver to the retailer high value plastic housewares meeting customer satisfaction requirements.

2000 Key Initiatives

- Proactively manage resource load
- Robotics/automation; robots already perform repetitive tasks such as stacking and labeling
- Cell/team development
- Total Preventive Maintenance (TPM)
- Cost reduction

Operational Excellence

- Customer service
- Budget performance
- Material usage variance (scrap)
- Productivity
- Machine utilization: percent of machines scheduled; OEE; OPE (overall plant efficiency)
- Safety
- Housekeeping

Figure 1.

Effectively Using Kaizen Improvement Process

Aggressive kaizen use as a continuous improvement (CI) tool drives change in all areas of the organization, according to Dan Berry, quality and improvement process manager at Cleburne. Kaizen projects' sharp focus on finding a better way to do things is not limited to the production arena, he added. "As kaizen facilitator, I hear from managers what areas they want to improve," Berry said. "For example, the production manager had a project on new hire orientation. We spend a lot of money on training people for quality production. We have the lowest unemployment rate in 20 years, so you want to make sure that when you get good people, you retain them. In looking at this area, we're investigating all areas of our program, asking whether or not each one adds value." Some associates will eventually be promoted into various technical and support jobs as Cleburne increases its use of robotics.

Kaizen projects start with a discussion of desired improvements in a selected area. "Then we discuss a general goal, then a numerical goal. Next we choose a team leader for the team who is knowledgeable in the process," Berry said. "We break the goals down into the finest level of detail we can. To achieve these goals, we ask, 'Who has the expertise to help us achieve them?'" He suggested keeping the organization's overall goals and key metrics in mind at the start of the kaizen process.

"We sit down and decide the expected length of the project — usually three to five days," Berry added. "There are generally six to ten people on the team as volunteers. Our team leader keeps everybody on track, using the team plan — it's a checklist we've worked out at the start of the project. We don't want to start heading off in the wrong direction. As a facilitator, I check with the team in the morning, during the day, and at a 3 p.m. update meeting — that's where various managers and the team leaders discuss how far the team has come that day and what they plan for the next day."

"What we're asking ourselves is, 'What are we going to do to make ourselves significantly better?'"
David Nelsen

Sometimes the team breaks up into two or three smaller teams to accomplish everything they've set out to do. When a kaizen process is under way, the kaizen team members spend all of their time on it. "We provide breakfast and lunch for then team and dinner if they are working late at night," said Berry.

On the last day of the kaizen project, team members present their improvements wrap-up to management. "It's nothing fancy, although they may use over-

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Dan Berry

heads," Berry said. "We need to see if they achieved their goals. The team may have three to four items on a 30-day follow-up list so they will have closure." At the end of every kaizen project, participants receive a team shirt and a certificate recognizing their efforts.

Kaizen's Broad Reach

Scheduling and TPM to get maximum capacity out of machines and a bill of material (BOM) team are among additional kaizen project examples at Cleburne. "The BOM team aimed at making sure whatever we make pulls the right amount of items needed to make products, to keep costs in line," Berry said. "We also had a recent internal audit project for ISO certification, a new hire orientation kaizen project. We have a tentative quarterly schedule for them, and we can add more projects as needed to meet the needs of the business."

Since Cleburne associates started kaizen projects in early 1997, they've completed more than 60. More than 500 associates participated in these efforts, identifying (and largely eliminating) more than $3 million in waste. Kaizen prowess also helps associates meet customer service and quality goals (see Figure 2).

Vendors are drawn into the kaizen game too. "Working with vendors to eliminate wastes in their processes helps them to keep their costs down and it keeps our costs down," Berry said. "These projects focused on inventory accuracy, reducing inventories to decrease cost and reduce freight cost, etc."

Rubbermaid Texas Limited Cleburne Operations Quality Policy

We want to continue to be "simply the best" within our industry by improving faster than all others.

Empowerment
Utilizing empowered associates to improve the business through participation and innovation.

Employer of Choice
Viewed by our associates and the community as the employer of choice.

World-Class Systems/Practices
Perfect our processes:

- Kaizen
- Cellular operations
- Standardization
- Total Preventive Maintenance
- One-piece flow
- Quick changeover

Grow the Business Profitably
Create a better customer value by maximizing our resources (associates, inventory, and equipment).

Figure 2.

Rubbermaid racks up a significant rate of return on kaizen projects (19 percent). Berry believes that recognition and employee involvement benefits deserve attention too. "What we've done has been very effective. People enjoy being recognized for these achievements and making changes that they can see affecting the business in a three-to-five day period — whether it's a smoother work routine they've worked out or other improvements," he said.

"We've changed our philosophy in people involvement, from the floor level to everybody else," he continued. "We only have seven managers here. We need everybody involved in running the business." Daily cell performance updates and "big picture" metrics shared monthly with all associates reinforce this awareness and involvement.

"We look at the Toyota production system as our model," Berry said. "They still are taking dollars out of their processes after 30 years. We don't see kaizen ever stopping, so we can continue being competitive. At some point, improvement you make today will become obsolete, so you will need to take another look — reviewing, involving and educating new people in, giving feedback, and reeducating."

Cellular Production: Responsibility for Making Improvements

Cellular production complements the people power of Cleburne's kaizen activities. Shortly after launching its kaizen approach in 1997, Rubbermaid Cleburne also moved into teaming as a way to engage employees and meet competitive pressures, according to Randy Cavasos, human resources (HR) manager. "We ran our business 17 years without cellular manufacturing," he said. "People were classified as processors. They went from one injection molding machine to another — inspecting material on the conveyor, trimming excess plastic (flash), putting on labels, and packaging the product. They didn't have a great opportunity to see how they fit into the big picture.

"We got a number of people from all departments involved and explained the concept of cellular manufacturing," Cavasos added. "Then we asked for volunteers for our cellular pilot (the Gold Cell a cell of four machines), a business within our business. Our pilot group was enthusiastic and they wanted to be successful. They came up with new and better ways to work together in their cell and they accepted responsibility for making improvements."

Goal-Oriented Training

People in the cell were trained internally to be cross-functional and to use the computerized system for tracking each day's performance in safety, labor, run time, scrap, rework, and housekeeping. Management had defined a skill block program tied to merit increases as they moved up to new skill levels (how to do color changes, drive a forklift, etc.). About 160 people out of 350 employees work in manufacturing cells.

"We're still moving forward and learning in our transition," Cavasos said. Skill training, TPM, and cross-functional work such as color changes are targeted improvement areas. He's heartened by employees' increasing involvement in the overall business. "We ask for their help and implement their suggestions," he said.

Training programs provide tools to boost their progress. Cleburne's skill block program for each cell, tracked by the cell facilitator, assures that people are moving along with needed training. In addition to technical topics, skill blocks include teaming skills such as Zenger Miller Working modules.

"We are training people in cells to do color changes properly, etc. to meet performance goals and help them to get pay raises as they work through all four levels in the production area," said C.L. Evers, cell facilitator and backup supervisor. It takes two years to go through all four levels; associates must demonstrate their skills for each level before gaining a related pay increase. "We set up training and visual information so that team members in a cell will know what we are trying to accomplish and how well the team is meeting its goals of higher skill levels," Evers added.

Teaming and training also power improvements in non-production areas. For example, distribution people developed an inventory accuracy team including one person who receives product from production and the warehouse, one putting product in the warehouse, and another associate who retrieves and loads material, said Charles O'Daniel, distribution supervisor. Two-person loading teams also work well; "they get loads out better and quicker," he added, "and every team feels that they have a business of their own."

Visual Management and Metrics

Performance measures "ownership" encourages associates as they put their skills to work in daily improvement activities. Each shift updates and reviews its own computerized records of progress — and any problems — in scrap, safety, rework, run time, labor efficiency, and color change time in a short meeting (Figure 3) at the at the start of their shift. Then they select their top priorities (needed action items) in labor efficiency and machine performance.

"Everything is visual on these measures, so everyone knows how they did during the previous 24-hour period, with updates every 12 hours (a master goal indicator)," said Kay Goff, production floor coordinator of Cell Information Centers where updates are posted. "Each cell has its own chart and a computer, to see what machines ran good or bad, and where scrap or rework sources are. We also use a passdown sheet from shift to shift for each machine, showing maintenance, flash, etc. If a team sees that it's falling behind, team members really get in there and work to make their goals."

Cell experts (rotated every four to six months) in housekeeping, safety, and other areas post computerized data on these metrics, calculated every 12 hours, according to John ("J.T.") Taylor, production manager. Operating equipment efficiency (OEE) numbers for run time and scrap, etc. are color coded so employees can easily spot troublesome processes. Every cell communications center has a visual board reflecting hourly performance metrics (see Figure 4).

Colorful lifting guides posted at each work station encourage safe practices. For example, only three of the operation's most popular totes can be lifted by an associ-

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Figure 3. *Cell members start their shift by reviewing performance data from their last shift during a six-minute meeting.*

The involvement of non-technical and technical people in housekeeping and TPM is notable.

ate at one time. Product specifications and packing specs are easily readable at work stations. Platforms elevate operators to a safe height to pack parts. The incidence of back injuries decreased after production started using these guides/practices.

"In the mold area, associates show on a dry erase board how long a mold has run," Taylor said. "We have a guide for each machine so that we can tell, for each item, whether there is excess flash and what issues there are for product quality. The involvement of non-technical and technical people in housekeeping and TPM is notable.

Figure 4. *Every workstation has a Kanban board featuring visual tools signaling recent performance; an associate is changing flags used to indicate scrap status.*

Figure 5. *Cell team member conducting a TPM on a 700-ton injection molding machine.*

TPM: Taking It Personally

"In the past, we didn't practice TPM," Taylor continued. "We used to shut a machine down and do PM (preventive maintenance) based on the equipment manual or when we had machine breakdowns. That all changed when we started with TPM; we had tougher machine standards we wanted to meet."

Despite initial doubts by the scheduling and planning folks, Cleburne management in January 1997 launched a two-hour weekly TPM for every machine. "Now they see the payoff, as we get better run times," said Darin Roye, technical manager. Machine run time measures reflect sources of equipment downtime: equipment failure, down for TPM, yearly PM, or R&D mode (for a new tool). Recent run time averages above the 90 percent mark compared to previous run times in the low 80s.

"Initially we had more housekeeping issues affecting run times. Now, after using a TPM approach, we're using more preventive methods," Roye said. "People notice the sound and smell of a machine, and whether it has a problem. They take it personally if a machine is down."

"We work with the cell TPM expert to train on TPMs and develop PM lists for each machine," said James Hartnett, a general technician in a cell. "Our TPM cart has all the cleaning supplies, grease, and materials used in our TPMs. Every day we meet with managers about run time, scrap, and other measures, and we also have a TPM on one of our machines — replacing hoses, doing any cleaning that's needed to prevent any problems. I am a first line of communication to the supervisor. If a machine has problem and it was in our control, we feel responsible for that." (See Figure 5.)

Each cell's TPM expert does fluid and other checks on machines for their shift. Weekly checksheets make it easy to review historical TPM data. The TPM expert also checks housekeeping daily, looking for clutter, Kanban violations, or things out of place. They also bring in someone to train non-technical associates on an aspect of TPM every week. A monthly housekeeping/5S audit complements weekly plant audits.

Meanwhile, each cell's communication expert reviews a "master goal indicator" for scrap rates on each machine, labor rates, and other performance yardsticks. Color-coded scrap indicators are posted on each machine; green is good, yellow indicates caution, and black means that there's no chance of making the scrap goal for the day. For each color, actions are specified — raising heat and changing a process, for example.

More Metrics: Impact and Involvement

"A labor expert in each cell makes sure we utilize cell members to the greatest extent," Roye continued. "They use two indicators. One is a forecasting report indicating how much labor is needed, given the cycle a machine is running on. Then they look at their staffing. If there are too many people in the cell, they can move to another cell or do housekeeping activities." At the end of the shift, a labor chart shows labor earned or labor deficiencies, based on BOM (bill of material) information and how much product was actually produced. The cell also compares its "Take the Tour" (checks of run time, rework, scrap, etc.) performance against goals for the day and the month. Management chucked previous allowances for offline machine maintenance, housekeeping, and rework, now letting cells incur performance decreases when unplanned downtime/defects gum up the schedule.

Performance goals for run time, scrap, and other cell metrics are reevaluated annually. The current targets for 2000 include 100 percent labor, rework at 0.2 percent of production, run time 90 percent or higher, and scrap at one percent or less.

"We have an incentive program for improving against goals," Taylor said. Associates earn time off (30 minutes a month) if their cell hits their mark. They also earn incentive pay for good safety performance.

Cleburne people also look to the Everyone Adds Value (EAV) quarterly assessment process for performance and learning feedback. (See Figure 6.) A manager goes from cell to cell, asking employees at random about TPM, computer use, and various processes. After grading each shift on their knowledge, management gives the shift that scores above 85 percent a pizza party.

Weekly housekeeping audits by the staff, supervisors, and associates from each department also underscore the value of clean and orderly work areas. "We continue to involve our associates in improving the status of their work areas," Taylor said. Ergonomics, job enrichment, training, and other associate suggestions drive many improvements and help to make the workplace more comfortable, he said.

Effective use of metrics marks all areas of the Cleburne operation, noted Kenneth Tice, customer service and traffic supervisor. Daily, monthly, and annual goals drive improvements, while teamwork and up-to-date performance data help associates to make needed changes, he said. "Besides our regular meetings and another meeting with representatives of each area in the facility every day, we have 5S walk-arounds (housekeeping and safety evaluations) to check how good cells look," Tice continued.

Any problems such as trailer or product shortages show up in daily meetings (Figure 7). Associates then prioritize and tackle these challenges to meet customer service goals. "Once you have good numbers, the meetings don't take that long. At the start its, 'Oh no, not another meeting!' But once you get over the hump and the numbers are

Everyone Adds Value!

Rubbermaid Cleburne managers ask associates at random about topics (selected correct responses are shown below) such as:

1. What are the scrap flags for, and how do you use them?
Scrap flags are a visual aid used to control scrap. They need to be updated with the counts on scrap cards every time a piece of scrap is produced. This gives a visual display of how well we are doing so we can tell very quickly if we have a problem.

2. What role do you play in preventing scrap?
My role is to clean and trim any part that can be salvaged without sacrificing the quality of the part; read my specification; etc.

3. What role do you play in helping the cell achieve its run time goal?
By being familiar with the machines — begin to know what the machines look like and what they should sound like. If something looks wrong or sounds strange, I should let my general technician know. If a machine goes down unexpectedly on the previous day, I remind my general technician the next day if we haven't fixed it yet.

4. What role do you play in improving labor efficiency?
I continuously look for the best way to process the parts. Are we double handling the parts? Can we exchange the layout to make it better?

5. What role do you play in safety?
Identifying hazards and seeing that they are removed, plus making sure that I lift correctly and pay attention to the "beach ball" zone (the lifting area from the shoulders to the waist in which a person can lift with relatively less potential for injury).

6. What is the purpose of the cell teams?
All of us together are smarter that any one of us; by having the entire plant focus on the goals and working towards improving our performance, we can have greater job security.

7. What is the benefit in 5Ss?
If there is a place for everything and everything is in its place, time spent looking for something is greatly reduced.

8. Explain the MGI (Master Goal Indicator — the computer program in the cell that shows cell members how they are doing on achieving their goals) Tour information to me (cell members only).
Show us what to look for as we view the information.

9. What value do you add to Rubbermaid?
Work to make the right goals; do it right the first time; drive waste out of the organization; work as an effective and safe member of my team.

10. What value is there in TPM?
Take care of the machine and the machine will take care of you; it's better to identify a problem early and fix it than to wait until the machine breaks down.

11. Why is making our rework goal so important?
All of us together ensure the part quality we ship to the customer.

Answers are scored 1-10 (10 is the highest).

Figure 6.

better, you don't dread the meetings because you're complimenting and bragging on your people, and you're resolving problems before they go further," Tice said. "It's like investing, and getting a great return on your investment."

Figure 7. *Each day starts with a 6:30 a.m. production meeting including cell members and managers; they discuss labor efficiency and machine performance during the previous 12 hours.*

Team Health Audit

Cell	Date	
Directions: Circle the number which corresponds below as they apply to your work unit. 1 strongly disagree 2 disagree 3 agree 4 strongly agree		
1. I understand the purpose of the cells		1 2 3 4
2. I am enthused about the team environment and cooperation within my cell		1 2 3 4
3. My individual goals and objectives are aligned with the goals and objectives of my cell		1 2 3 4
4. I am clear about my responsibility as a cell member		1 2 3 4
5. I am comfortable enough to share my ideas about improving my work environment with my fellow cell members		1 2 3 4
6. The cell expert functions within the cell are being well handled and add value		1 2 3 4
7. The cell expert functions are clearly defined so that there is little or no duplication of effort		1 2 3 4
8. There is an overall game plan for achieving desired results and I clearly understand my role in that plan.		1 2 3 4
9. Problems are solved in a timely manner.		1 2 3 4
10. I understand the decision-making process and how I fit into that process as a cell member		1 2 3 4
11. I am satisfied with and have input to planning for future success		1 2 3 4
12. Conflicts are resolved in a timely manner by my supervisor or cell facilitator		1 2 3 4
13. I respect the opinions, thoughts, and ideas of my cell members and they respect my opinions, thoughts, and ideas		1 2 3 4
14. I am satisfied that I get enough support from my fellow cell members		1 2 3 4
15. I trust my fellow cell team members' intentions and motivations will benefit the entire cell		1 2 3 4
16. My relationship with my supervisor is productive		1 2 3 4
17. Team members are encouraged to express their ideas		1 2 3 4
18. As a cell member I understand all policies, procedures, and guidelines		1 2 3 4
19. The team has the necessary resources to accomplish its mission		1 2 3 4
20. There is enough training and development for the cells to achieve success		1 2 3 4

Figure 8.

Team Health Audit and Trust

Cell members provide feedback about their team through an audit process once a quarter. "We call it a team health audit (see Figure 8)," Taylor said of this anonymous audit form. "It helps us to understand how they feel about the team, including their goals and objectives."

Monthly cell meetings and meetings each month between six associates with management keep issues out in the open. "For example, in one shift, they discussed ways to improve their working relationship with the facilitator — how to get their skill books signed off, etc.," Taylor added. "We need to continue building a tremendous amount of trust to get to the next level of performance. People need to feel that they are successful."

"Lessons Learned"

"Lessons learned" by Taylor and Roye about the transition to teaming and building trust included:

- *Start with a small pilot and perfect it before you go to the next level; people want to feel they've achieved their goals.*
- *Before you implement a new approach and hold people accountable for its success, invest needed time, patience, and proper training.*
- *Commitment and support from top management are essential*. "Luckily here, it was David Nelsen's goal to support our conversion to cells and other changes, and he provided training and other resources needed to make our goals," Taylor said.

Nelsen added a few more "lessons learned" at Cleburne. "One of the keys is to make everything measurable," he said. "For example, if you're talking about empowerment, how do you track progress in performance improvements? Also, you need to communicate before and during change implementation. Change has to be interactive. There will always be questions and misconceptions. You have to plan to listen and follow up like crazy. Learn from others through educational events and benchmarking best practices. Find reasons to change and take risks. Then selectively focus on key targets and get started on improving your competitiveness and ROI."

Lea A.P. Tonkin is the editor of Target *magazine.*