

Going for a Higher Grade: Aerco International

From "C-Class to B-Class"

Robert W. Hall

Visitors to Aerco International immediately feel the vibrancy and passion of the people. A sense of urgency fills the air, as it does when people knowing they are going somewhere are anxious to get there.

Now becoming a "learning organization," Aerco wasn't always this way. Physical transformation toward lean began in 1999; and the mental transformation before that, in 1994, when Basem Hishmeh, now the chairman, and other managers began attending AME meetings, struggling to learn what lean was all about. By 1999 they were ready to stop passive learning and start active learning.

The physical changes are now C-Class, but cultural changes signal movement toward a higher grade. To achieve superior performance as an organization, employees put the common good beyond personal aspiration. For example, it's not difficult to find volunteers, who, to help a customer in trouble, will drive three hours on a Friday night to make sure that a repair part is "Fed-Ex-ed" to its destination.

This culture is a combination of pride with humility: pride in what is being done; humility in how much more can be done. Although Aerco has not arrived, they are determined to get to B-Class. The road from C to B is paved with the cultural and

About Aerco International

Heat You Can Bank On™

Aerco is into hot water. Its product line: boilers and associated controls, mostly for buildings, like schools, hotels, and hospitals, not residences. New units are installed by contractors and sold through 62 domestic rep agencies and 29 foreign sales offices.

Aerco's customers buy heating efficiency. A network of small, safe boilers in unobtrusive locations saves energy through shorter pipe runs, less ancillary equipment, and more control flexibility. Traditionally higher-priced than competitive units, sales reps have to educate prospective buyers in how a higher initial price could soon be recouped by lower energy bills and a simplified system.

The company began 53 years ago where it is now located in Northvale, NJ, north of New York City. A concrete block building houses the 50,000 square foot factory and administrative offices; engineering offices are across the street. Employment has held steady at about 100 people for several years. Annual sales: about \$35 million. Shop employees are represented by a union.

During its first 30 years Aerco was almost a hobby business; never making much money, and never out of debt. In 1982, Basem Hishmeh and Tim Buhl bought Aerco, intending to turn it into a commercial success, an ambition not fully realized until Aerco began to liven up with lean manufacturing.

Since 1999, Aerco has been an enthusiastic practitioner of lean thinking, hosting three AME events, two for Champion members. In 2003, Basem Hishmeh became the president of AME.

A-B-C Working Culture and Accomplishment Classifications

Class	Characteristics
A	Able to refine operations for a new product or process very quickly. Teamwork improving processes is spontaneous; status differences are trivial. All routine process improvement is autonomous. Can serve as a mentoring organization for others (a "mother" operation) and as a training ground. Participate in making the operations at customers and suppliers much more efficient (customer-in) operations. Probably a model for the industry; possibly has a novel business model with customers.
B	The entire operating organization (all functions) has become much more a team (no "silos"). Much greater visibility of both customer needs and supplier processes; very fast feedback detecting and dealing with problems anywhere. Non-manufacturing processes are streamlined. The culture promotes autonomous operations and autonomous kaizen. Processes are developed for great flexibility as well as efficiency and effectiveness. (Workers can and do take initiative on almost any improvement, including some technical ones.) Very open information systems.
C	Have converted a core operation (usually a plant) to lean with beneficial results. Cultural change is sufficient for the conversion, which usually means that a few people that could not adapt to the changes or the teamwork left. Improvement projects are proposed by the staff (staff-instigated kaizen blitzes, for instance). Workers take initiative on small suggestions, but changes that require coordination are staff-led with worker input and concurrence.
Pre-C	Experimenting with tools ("kicking the tires"). No integrative process improvement experience. No impact on work culture. Little or no benefit to immediate operations.

From "The A-B-Cs of Building a Community of Excellence," *Target*, Vol. 19, No. 1, First Quarter 2003, Figure 3, p. 26.

organizational changes that accompany process changes — the glue that makes lean sustainable, as well as further improving performance. Human development is the key to a better grade. (See the "A-B-C" box copy.)

The A-B-C Framework has three components: 1) Process Improvement (the "lean" scale), 2) Innovation, and 3) External Responsibility (especially to customers, but to all stakeholders). Aerco is working on all three dimensions and now rates a high "C" on all three as shown in Figure 1. The enthusiasm for B exists, but much of the accomplishment is still in the aspiration stage.

Aerco is developing a "community of excellence," defined as: *A community of people, bigger than one company, always striving to perform better, and always on behalf of the quality of life for **all** its stakeholders.*

Of course, money is important. Aerco is just emerging from a long history of restrictive bank covenants. To perform well by all stakeholders, Aerco needs more sales and higher margins. Excellent performance is not attained by being penniless, but by an attitude to earn the return as a result of superior performance in every aspect, rather than use financial goals as the primary driver of improvement. Aerco plows newfound gains back into the business — for training, for product development, and for new initiatives. Company debt is now much lower, but the goal is to be completely free of it, and thus free of restrictions. However, the big step is migrating toward thinking of the business as its people, not as inert assets, brand image, or intellectual capital.¹

The History of Getting to C

Until 1999, the Aerco plant produced in batches with classic job shop controls. The revolution has both been fun and a test of faith in lean. Aerco lost money the first two years of conversion, but persisted, turning around financially and achieving a great deal.

Outsourcing machining operations eliminated several monuments obstructing flow, which is now one-piece. Setup times are much shorter. A system of pull signals regulates flow into mixed-model assembly, not only inside the plant but from primary suppliers. Primary flows are easy to follow; the plant runs by a visibility system. For example, at least once a day, and usually more often, everyone sees the scheduling white board in the lunch room and can watch it being updated if they have time. A linearity board tracks daily completions against schedule. Anyone can also walk into the office to see the sales-production whiteboard (called the Profit Zone) where orders are converted from generally confirmed to definite delivery. Delivery dates typically depend on customer project schedules unpredictable far in advance. Using 5S kaizen, work to increase detailed visibility within the work stations has begun.

Aerco International's Ratings by the A-B-C Framework

Class	Process	Innovation	External
	Improvement		Responsibility
A			
B			
C	X	X	X

Figure 1.

Getting to C: Selected Metrics from Aerco's Own Scorecard

Measure	1999	2002
Revenue per person	100%	166%
Total cost of quality	4.22%	1.45%
Linearity to schedule	70%	97%
Overhead per unit	100%	58%
Material availability	70%	99.9%
Total inventory turns	3	11
Avg. Order leadtime (weeks)*	6-8	2

*A customer order can be built, tested, and shipped in three days, but two weeks is the average time between customers calling in a delivery date and shipment of their units. Sales/production planning assigns orders to production slots like assigning seats on a moving train.

Figure 2.

All information is open — but mere availability does not make it known. Once a quarter Fred Depuy, the president, meets all employees in small groups to present a status of the business and answer questions. Small groups encourage questions that people would not pose in all-company meetings.

The work culture is being reshaped by development through lean methods and lean leadership, but new patterns of work and thought do not become habitual overnight. A report on Aerco's work in progress is shown in Figure 2. Improvement has resulted from total company transformation, but change is continuing, and perhaps even accelerating.

As with most conversions, Aerco lost people when change became serious, 27 out of 100 during the first two years — when finances were not good. Besides attrition losses, some left because they could not adapt. Nine took early retirement. In retrospect, Fred Depuy says the retirement offer was a mistake; few acceptances were expected, and valuable experience walked out the door. The positive side is that everyone now at Aerco "wants to be on the bus," and the number of change agents keeps growing.

Aerco also trimmed suppliers and asked for a ten percent price reduction in return for long-term working agreements. The right suppliers responded — the ones that could make up the ten percent by better communication and assurance that they could invest in service to Aerco without fear of losing follow-on orders. Now Aerco is following up to help selected suppliers become lean. According to Rose Marie Swoboda, supply chain manager, "The program has strengthened our supply chain and also positioned Aerco to be a better customer."

The newest initiative to lower water levels is 5S. Besides improving visibility for

daily operations, the objective of 5S is to enable everyone to spot "rocks" for removal:

- Real or potential defects and field quality problems (apply Six Sigma)
- Safety violations
- Any other impediments to lean conversion.

Going for B

Aerco's first initiative toward B was New Product Development (NPD). Old designs left a trail of field problems, and a steady diet of retro projects chewed up engineering time. NPD obviously needed more resources and a new process. As lean

**...everyone now at Aerco
"wants to be on the bus"...**

Transfer of Cash and Process Improvement from Shop Floor to NPD

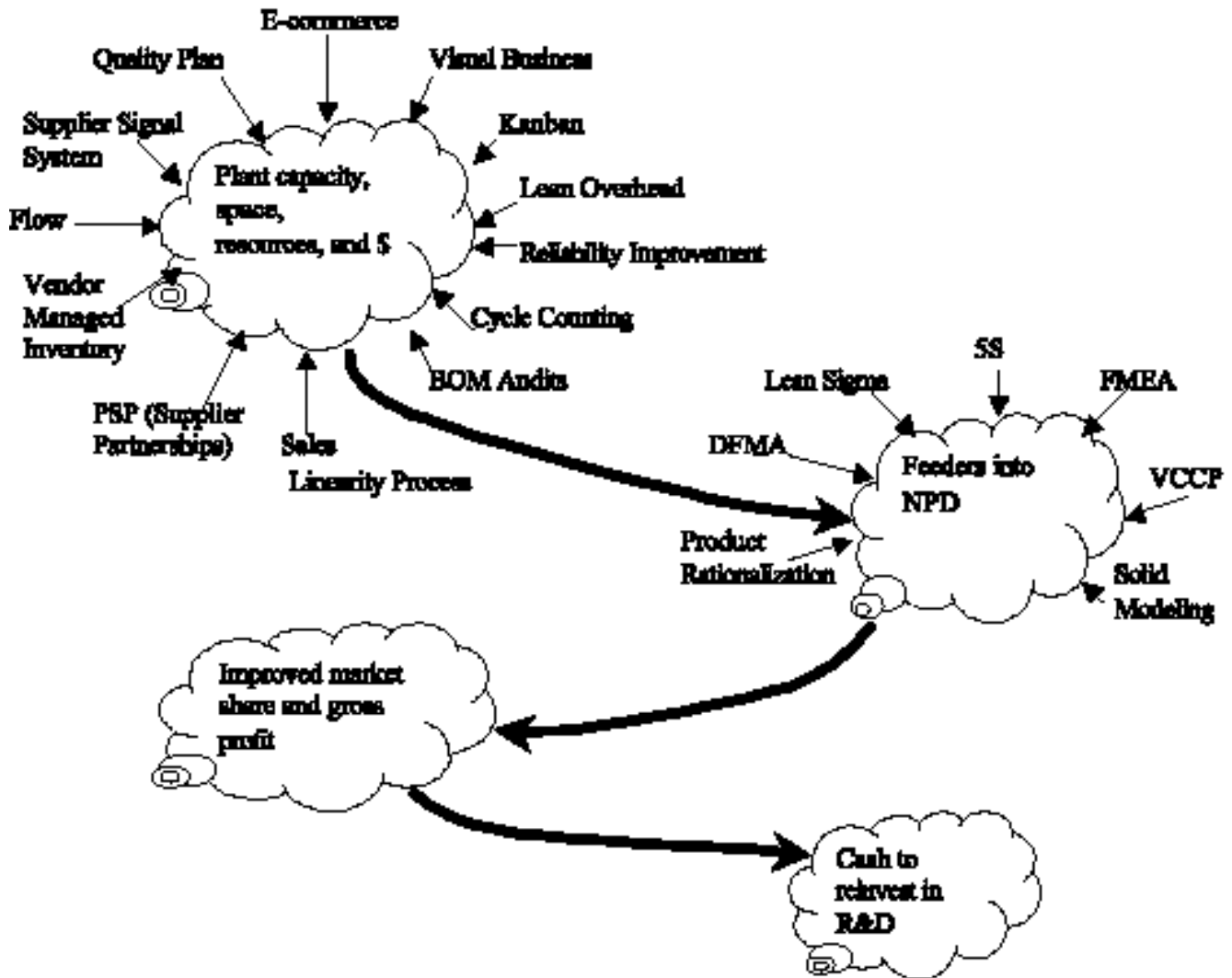


Figure 3.

began to free cash and people, Aercos pointed them at NPD, as diagrammed in Figure 3.

Needed was a new product platform, not a tweak of old ones. Well-designed, a platform is easily modified for different applications on many customer orders, so a platform project is a major investment in the future. As is well known, "90 percent" or so of future operating costs are locked in by a product's design. So is about "90 percent" of future customer satisfaction, so this is a

bet-the-company program.

Since Aercos lacked big bucks to invest in R&D, they invested in people, developing a new NPD process by adapting ideas learned in production. The "old way," a new product was estimated to take five years — or forever. Aercos's ambition was to launch within 18 months using an internally-developed Visual Cross Check Process, or VCCP.

VCCP glues together the new cross-

Lessons from Production	How Applied to Product Development
The power of cross-trained people	Cross-functional teams; co-leaders from engineering and operations bridge gaps.
Increased skill sets included facilitation and process skills.	Acquire all technical skills needed. All members have process/facilitation skills.
Customer focus for quality and delivery	Focus on market differentiation needs
Sense of urgency: On time delivery shot from 70% in 1999 to 95% in 2002.	Urgency to differentiate specifications to different targeted market needs
Linearity tracking to schedule	Complete technology blocks by milestones
"Gang up" to attack barriers to flow using problem loop process (PLP)	"SWAT Teams" attack development snags using PLP (and other tools, like Six-Sigma)
Visual system; 5S; open data	Visuals everywhere; regular meetings
Accountability/ownership is clear	Accountability on assignment boards
Balanced performance system	Checks and balances in the process

Shown are only a few ideas transferred. VCCP is a living, continuously improving process.

Figure 4.

functional NPD organization called the Profit Engine Team, bulked up by extra talent released from operations to 27 percent of the total headcount. A few people transferred into it full time; many operational leaders are flex members. Profit Engine Team meetings in a white-boarded war room make the process and its deliverables highly visible. Larry Rubin, VP of operations, thinks that "Our Cash-to-NPD process created a tremendous focus on overall operational effectiveness. The new platform is the future of our business, and the goal I share constantly throughout the operation is to manage the business to be profitable — so that you can retire from Aerco when you want!!!"

Aerco did not make the 18-month goal. Quality trumps milestones. Wanting no field issues, they extended the goal to 24 months in order to apply DFSS (Design for Six-Sigma) and avoid solving one problem only to introduce another. For instance, one trigger for DFSS was discovering that a subassembly redesigned to reduce parts resulted in an overly complex part — too

many steps to make, some of which taxed process capability. They also invested in an NPD Rep Team, which includes five Aerco sales representatives. It meets quarterly to review project status and its prospects for meeting — or surpassing — customer expectations. They are learning fast, confident that in the next NPD cycle they will "nail these things."

More important than the immediate process is that Aerco's work culture continues to change rapidly. The vision, "To be the number one choice of every customer," is supported by daily execution to achieve the goals of 2003's three-point strategy:

- Release Innovation Platform (NPD)
- Implement Robust Quality (as experienced by customers)
- Focused Strategic Sales Plan (make Aerco easy to do business with).

Each of these strategies, with projects and names attached, structurally guide improvement. Aerco's management team uses an "alignment tool," shown in Figure 5 to accomplish three tasks: 1) Manage daily risk, 2) Make sure all employees understand

Aerco links the execution of day-to-day operational initiatives with their vision through their top three strategic priorities.

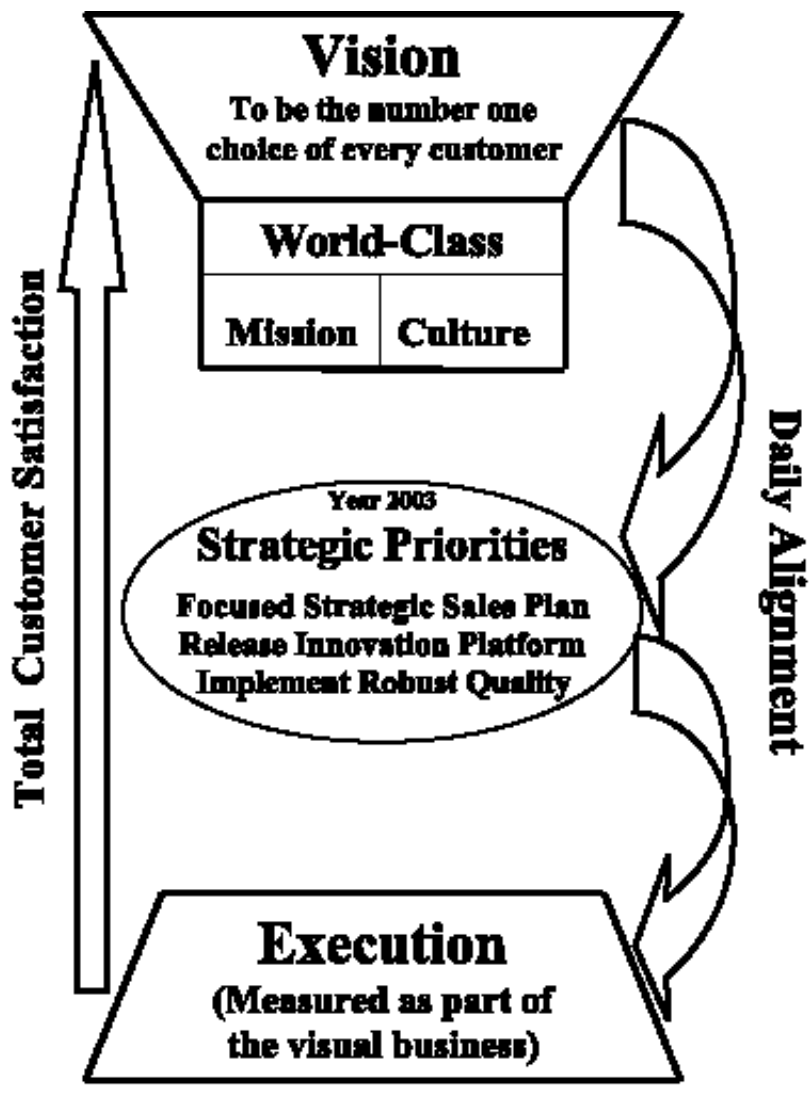


Figure 5.

the business' strategic direction and their involvement in it, and 3) Ensure daily linkage between operational initiatives and the top three strategic initiatives. Every Tuesday, the first question out of the gate at the management team meeting is "Are we aligned?"

Equally important, or perhaps more

so, is the process of migrating toward an outside-in culture, as opposed to inside-out. To better orient everyone externally, Aerco adopted a saying, "Build it Like You Own It," with the logo shown in Figure 6. Part of getting to B is also making the Aerco team easy for others to work with, whether customer, rep, contractor, supplier, or just an interested party.

Aerco is already a strong C on external responsibility. It's a seemingly little thing, but a caller to Aerco gets a live response, not a phone menu. Hosting visitors is a daily activity; up to 50 reps, customers, or suppliers visit the plant each month in addition to other visitors. At one time, so many visits would have been considered disruptive of operational "efficiency," but many Aerco employees now look forward to meeting visitors. Customer visits force the company to maintain a higher standard, and it's more fun when there are accomplishments to show.

However, visitors see the real Aerco — get an honest tour. No longer is anything special done to prepare for a visit. Visitors see what Aerco does well, and sometimes see something that Aerco wishes they did better. A soft metric Aerco uses is "whether the sum of all the clean laundry is greater than the sum of the dirty." And the dirty must have a response plan. The openness is brutal at times, but the Aerco team is getting used to it, and growing stronger all the time.

The company is also big on benchmarking. Competitive products sit where everyone can see them. Aerco's goal is to have every employee make at least one benchmark visit or customer visit every year, a goal usually reached. According to Jeff Chasen, manufacturing manager, "I've been to several 5S benchmarking sites with our team leaders. Each site proved very educational, and the actual trips provided an excellent forum for team building with those that attended."

To Get to B-Class

Aerco is not at B-Class because it has not had the time and experience to get there. They are making good progress toward it.

In the plant, the tools and culture are still not fully embedded. Improvement is still driven by Kaizen Blitz; at B-Class much of it spontaneously arises. For example, 5S is still being inculcated by blitz education. Visibility at the detailed work station level will become sharper.

People are just beginning to unravel the mystery of standardized work, and conquering this challenge takes time. Most C-Class companies bury this challenge in a heap of quality initiatives. When adept at standard work, which is the human side of process capability, a worker can document what is done so that another can actually do the same thing; then improve the process, document it, and everyone can hold the gain. Aerco's next big production challenge is to refine the production process for the new platform. At B-Class, a workforce can quickly reduce a process for building a new product with a different schedule into standardized work. Aerco is gung-ho, but just starting its first round of learning about this.

In innovation, Aerco has just completed their first new product cycle. New services are mostly in the planning stage. Aerco wants to out-innovate the industry, and they have a fair shot at doing it. Ambition is high; enthusiasm contagious, but they have not had time to practice and demonstrate accomplishment.

In external responsibility, Aerco wants the effects of lean to be so obvious to customers that they recognize that Aerco is "a cut above." The company has adopted a Customer Satisfaction Metric. They are hiring a Customer Satisfaction Liaison to call customers and assess their experience with Aerco's products, sales agencies, technical documentation, and factory service. To set their industry's standard for customer satisfaction, Aerco believes that they must become proactive, not reactive to field problems. They want to equip their existing customer base with current product improvements without financially taxing them.

The intent is to extend the disciplines of continuous process improvement into how all Aerco's "customers" view their per-



Figure 6.

formance. To do that, they must become more customer-connected. At B-Class, a company often knows what customers need before they ask, which for Aerco means that they must also become their reps favorite company to do business with. Neil Pilaar, director of sales and marketing, wants to extend the principles of lean thinking throughout the sales and customer service processes.

Aerco is well positioned to become an outside-in organization. Functional departments still exist, but the walls between are porous because of all the cross-functional teams. Significantly, the sales and marketing staff are deeply involved in lean changes. And Fred Depuy, the president now leading the changes, spent 14 years in field work before taking the leadership position.

The nature of its product line makes Aerco an environmentally responsible company. In due course, it can mature into an industry leader in environmental sustainability.

Leadership

People absorb lean thinking and culture partly through training, techniques, and teamwork — but much of it comes from emulating the examples of their leaders. Leadership gets an A at Aerco. Not that the leaders don't make mistakes; they do. When they make a mistake, they admit it, pick up the pieces and move on, like everyone else. No blame passing; no "we and they" remarks. Leaders have to learn their role too.

Leadership developing a new culture is evident throughout the organization. For example, the Labor Management Committee meets monthly. They don't have anything to dispute, so the committee has become a forum for agreeing on change. Both a federal mediator and the local's business agent have described the monthly meetings of this

committee as a model for other companies. The committee's mission statement, agreed upon in 15-20 minutes, says it all:

Why We Are Here: Our goal is to produce the finest quality products that satisfy our customers' needs in a safe, professional, and productive environment.

Aerco managers have learned to practice recognition as part of daily work, which necessitates being observant of both work and workers. As evidence, they cite being surprised at a Ken Blanchard program when Ken asked how many managers could name an employee that had performed above expectations in the past month, week, or day. Only the leaders at the Aerco table could name standouts from the previous day. And when Basem Hishmeh, who as chairman is often away from the home office, comes through the plant, he makes it a point to talk to a lot of people and to recognize those who have been making extra contributions.

Fred Depuy notes that he had to learn the hard way to make change a seamless part of the company's culture. An ongoing challenge is balancing the need for continual change with the capacity and skill sets of the people. When the direction of change is on the line, people want to see defining moments of leadership personally, leaders making decisions in their presence, not in their office. At Aerco, the leadership belief is that at the end of the day three things occur:

- Results
- Recognizing individuals who achieved the results.
- Having fun.

At Aerco, the thinking is that people will be loyal to a company if it is well led and if they have real responsibility — no make-them-think-they-participating games. The leadership initiatives in Figure 7 complement the lean techniques. And these initiatives are as important to getting to B-Class as advancing in techniques; one is not sustained without the other.

Aerco reviews the leadership performance of everyone on the Management Team on the attributes shown in Figure 8, using a

Initiatives to Develop Leadership at Aerco

- Be a well-led company, not a well-directed one. (Leadership is a person-to-person experience, not a "decision making" process.) People don't leave poor companies; they leave poor leaders.
- Develop people; develop them to improve processes. Let them make it happen.
- Today's team leader is tomorrow's team member, and vice-versa.
- Keep goals clear. (If we're not thinking broadly, we lose.)
- Self-fund improvements; take responsibility for the organization's destiny. (Don't envy greener grass across someone else's fence; water your own grass.)
- Get results; recognize performance often; have fun.
- Have an outside-in focus. (See processes from the eyes of the customer.)

Figure 7.

Attributes on Which Leadership is Rated at Aerco

1. Visionary Leadership Skills: Aligns his/her area to help actualize aims of the president's vision. Has a mindset toward continuous process improvement and the recognition of people as valuable change agents.
2. World-Class Change Agent: Drives others to succeed at becoming a world-class enterprise by setting an example with own actions of higher standards and increased process implementation in his/her respective area.
3. Business Acumen: Good knowledge of how the business model works and how value is created. Demonstrates an understanding of how his/her team adds value as it pertains to the corporate priorities.
4. Results Oriented: Drives strategic priorities forward. Manages tasks versus corporate priorities well. Demonstrates consistent performance-versus-goal attainment.
5. Analytical: Communicates clearly and presents knowledge in his/her area of specialty. Possesses appropriate knowledge and education to be able to calculate and balance risks as changes are implemented.
6. Customer-Focused: Values driving the business from a customer centric model. Acts in a way that is in line with "the customer is always right." Participates in improving customer (internal/external) service. Makes sure his/her area is ETDBW (Easy To Do Business With) from a customer perspective.
7. Faithful/Energy: Motivates others to do their best. Maintains a positive outlook. Controls negative emotions, remaining professional through difficult decisions.

Figure 8.

three-classification rating on each one. In such a cross-functional organization sometimes you're a leader, and sometimes you're a team member. All roles need to be well-executed.

Stability of Progress

Aerco banks on its people much more than their bank does. The ownership recognizes that the level of achievement of all 100 Aerco personnel embodies the real value of the company. Without them, the residual assets — those that count on the balance sheet — are worth only resale value.

Developing people takes time with people who stick around and stick with it. Regard personnel as parts interchangeable with other companies, and progress toward B-Class comes undone.

But personnel stability depends on stability of leadership, which in turn depends on stability of ownership. Privately held, Aerco ownership is stable, and the owners are interested in developing the people. That's a crucial connection.

New Jersey is not a low-cost manufacturing area, but there is no thought of moving operations, or of selling the balance sheet assets to an ownership that doesn't "get it." That's a contrast with companies, public or private, that keep operating organizations destabilized by shifting top managers or by shuffling "assets" to boost shareholder value. Instead, Aerco's owners keep watering the grass in New Jersey, letting their people create the value.

Footnote

1. Contrary to grammatical rules, *Target* often refers to companies or company sites as people, not as objects. For example, we frequently refer to a company or a plant as "they," not the grammatically correct "it." These errors are intentional.

Robert W. Hall is a founding member of the Association for Manufacturing Excellence and the editor-in-chief of Target.

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