



Center for  
**Quick Response**  
**Manufacturing**  
University of Wisconsin-Madison

# QRM PROFILES

## Business Velocity at TCI Creates Barrier to Domestic and Offshore Competition



*The QRM Center is a university-industry partnership dedicated to improving manufacturing competitiveness through research and implementation of lead time reduction principles.*

# QRM Boosts TCI's Growth, Profitability, Reputation

by Kathleen Watson

"There isn't a company in the world that couldn't do this," insists Steve Copp, chairman of the board of Wisconsin-based TCI, LLC. "It's universally transferrable."

He's talking about Quick Response Manufacturing (QRM), a business strategy developed by University of Wisconsin-Madison Professor Emeritus Rajan Suri that focuses on time as a competitive advantage.

Copp has endless praise — and the metrics to back it up — for the companywide approach that has catapulted TCI into the position of a market leader with enviable growth, exponential profitability, and a sterling reputation for serving customers in a way that fosters unshakeable loyalty.

TCI specializes in products and services that improve the reliability and efficiency of electrical power used in commercial and industrial systems. Typical installations are found in manufacturing, HVAC systems, oil and gas pumping stations, water and wastewater systems, agricultural irrigation

systems, elevators and escalators, and refrigeration systems. Products range in size from a human fist to the equivalent of two refrigerators.

## Challenge by major customer leads TCI to QRM

The company's QRM journey began in 1995, when a major customer of line reactors challenged TCI to dramatically cut — from five weeks to just one week — its lead time for that product. The customer had been able to reduce its own lead times, which in turn influenced expectations for suppliers.

The request, along with a six-month ultimatum to meet the goal, sent TCI management scrambling. What would it take: adding people, adding machines, expanding manufacturing space?

There had been signs — declining financial performance and other key indicators as well as an escalating cost structure — that TCI's model was becoming obsolete, but this requirement from a key customer made the need for change compelling.

TCI's owner at that time was part of a group of executives who met monthly for daylong sessions that included a morning discussion and an afternoon presenter. QRM founder Suri was a featured speaker just as TCI was searching for a solution.

Suri's presentation included information on cellular manufacturing, an element of QRM and an approach TCI learned its customer was using to reduce lead times. TCI's owner invited Suri to visit its plant and address the company's management team.



## Company Profile

Founded in 1961  
in Milwaukee, Wis.  
Privately held  
Headquarters & production  
moved to new 66,000 s.f.  
Germantown, Wis., facility  
in 2014  
125-175 employees / 3 shifts  
ISO 9001 Certified

## Products

Line Reactors  
Passive Harmonic Filters  
Active Harmonic Filters  
Sinewave Filters  
Motor Protection Filters  
Power Factor Capacitor Banks  
EMI Filters

## Markets Served

Industrial  
HVAC  
Oil & Gas  
Water & Wastewater  
Irrigation & Agriculture  
Food & Beverage  
Elevator & Escalator

## Awards & Recognition

Association for Corporate  
Growth Wisconsin's 2015  
Outstanding Growth Award

[www.transcoil.com](http://www.transcoil.com)



Steve Copp, Chairman of the Board





*Brian Sobczak, Corporate Quality & Continuous Improvement Manager*

Meanwhile, Corporate Quality & Continuous Improvement Manager Brian Sobczak had begun learning about QRM, where he discovered the term “response time spiral.” Sobczak now had a name for how TCI’s dysfunctional operations were contributing to long lead times, and he began emphasizing a time-based focus in TCI’s operations.

### **Focus on time prompts changes that yield immediate results**

TCI took four steps consistent with QRM methodology that began showing immediate results:

1. Implemented manufacturing cells that incorporated winding and assembly operations previously done in isolation of each other
2. Cross-trained cell members
3. Worked with suppliers so they could support TCI’s accelerated needs
4. Developed a simple tool that enabled customer service representatives to commit to a delivery date at order placement

“These combined improvements helped TCI reduce its lead time to one week from order initiation, successfully meeting the challenge of the customer whose request prompted our turnaround,” Sobczak says.

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“Combined improvements based on QRM helped TCI reduce its lead time to one week from order initiation, meeting the challenge that prompted our turnaround.” — Brian Sobczak, Corporate Quality & Continuous Improvement Manager

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### **Unexpected benefits boost market share, cut costs**

TCI supplies OEMs such as the major customer requesting faster delivery as well as a network of distributors, integrators (create multicomponent systems for their customers), and agency sales representatives. Copp remarks on one of the unexpected benefits QRM brought to its expanded distribution network:

“We discovered that by reducing our response time, we could drop the stocking requirement for our distributors. They no longer needed to order a 12-month supply, with its inherent up-front investment plus the costs of storing parts, of handling them and the potential for damage, and of the restocking charge for returning unused merchandise.”

Before long, TCI was able to drop-ship orders for distributors, further reducing product delivery time and costs for everyone involved.

With its new QRM ability to meet the needs of OEMs, integrators and distributors almost on demand, TCI leaped ahead of its competitors and gained significant new market share.

Other benefits emerged as well: The exclusive focus on time — on lead-time reduction — unexpectedly increased on-time delivery for all customers, while reducing WIP and process costs.

Encouraged by the results and sensing the potential to develop even more new business, TCI set an aggressive second goal of a two-day lead time for its line reactors.

It expanded manufacturing cells to include its testing operation, redesigned the product to simplify both the winding and assembly processes, and standardized the varnish material.

Manufacturing time dropped from five days to two days, and the singular focus on lead-time reduction yielded yet more improvements in on-time delivery, quality, and process costs.

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*TCI product families cover a range of sizes and have thousands of configurations. Line reactors can be the size of a human fist (a 2-amp unit weighs 4 pounds) to the size of a refrigerator (a 1,500-amp unit that weighs several hundred pounds).*



*This KDR line reactor, one of TCI’s smaller products, has components that equal the size of three human fists.*



*Although it stands as tall as a refrigerator, this HGA Active Harmonic Filter is not the largest in TCI’s line. However, it represents one of TCI’s standard products.*

## QRM expands from shop floor to office

Approaching 2000, TCI was reaping multiple QRM benefits, but almost entirely in manufacturing. Despite significant lead-time reduction, there still were complaints that some orders were taking too long to work through the overall business system.

“We were learning that it could take three or four times as long to *process* an order as it took to actually *produce* the order,” Copp says.

It was time to begin aligning the company’s overall mindset to take full advantage of QRM through broader application of its principles and methods.

TCI’s engineering and order-entry functions were inefficient. “Just as we had on the shop floor before cross-training, we had narrow expertise in the office, and practices such as batching created delays,” Copp observes.

However, the company owner had concerns about how office personnel

would react. Would the QRM tenet of cross-training be welcomed in this setting?

Some engineers resisted learning how to process an order for those occasions when their assistance could save time, pointing out that they didn’t survive the rigors of college to be order-

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— Steve Copp, Chairman of the Board

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takers. Nor were they pleased about the prospect of having to interact directly with customers.

Although both Copp and Sobczak fully supported the expansion of QRM, there was indeed resistance to change and to cross-training. To counter the negativism, Copp, who became TCI’s president in 2002, became a powerful and convincing QRM advocate.

Sobczak, who worked with Suri to earn certification as a QRM

instructor, led the charge to take QRM companywide. He developed customized training, organized book clubs to read and discuss Suri’s *It’s About Time: The Competitive Advantage of Quick Response Manufacturing*, and worked hand-in-hand with employees to get them on board and up to speed with a time-based mindset.

“We talked openly about QRM as an enterprisewide philosophy, and we stressed that if TCI didn’t change, we couldn’t be successful,” Copp recalls. “We pointed to our successes in manufacturing as well as in customer service and purchasing, and we talked of business velocity as not only a strategic competitive advantage, but as the key to our long-term corporate survival.”

## Profit-sharing changes to highlight incentive, equality, fairness

As management learned more about the psychology of change, TCI revised its profit-sharing plan to level the playing field, offering an incentive that highlights TCI’s commitment to equality and fairness.

“We’d always had a profit-sharing plan with a tiered bonus system that was heavily weighted toward management — especially executive management, which is typical in most companies,” Copp explains. “But because we were stressing that we win or lose as an entire organization, we decided that our philosophy and practice needed to be reflected in our bonus system.

“In 2006 we instituted partners profit-sharing, where everyone in the company — from the CEO, to operators on the shop-floor, to marketing staff,

## Personnel and hiring practices evolve with QRM

The participative and shared-responsibility aspect of working in a company with QRM as an operating philosophy is reflected in the people you hire.

While TCI was making progress with the fundamentals of QRM, the psychology of change was getting scant attention. Loyal employees took a leap of faith, but there were some skeptics when QRM began to expand to engineering and order-entry.

After all, QRM was revolutionary for that time; even Lean was still a fairly new concept.

Not everyone wants decision-making responsibility. Not everyone wants to learn new skills required for a cellular organization. Not everyone is comfortable with the give-and-take involved in a team approach.

Hiring practices evolved, and TCI began interviewing candidates with attributes better suited to the dynamics of QRM.

“Whether for a position in the office or in manufacturing, we look for a combination of skill sets – or someone who is open to learning,” says board chairman Steve Copp. “If you’re an excellent coil winder, and you want to do only that, you’ll be happier elsewhere.”



*Ashish Bendre, President and CEO*

to customer service representatives — gets the same bonus percentage based on overall corporate performance. It helped erase boundaries and created a more cooperative environment. Now everyone is on equal footing; the new structure emphasizes that we're all in this together."

### **QRM streamlines product development**

Ashish Bendre was promoted to president and chief executive officer in 2015 when Steve Copp became chairman of the board. Bendre appreciates the difference QRM has made in product development, essential to a company's growth and vital to maintaining its competitive edge.

"Velocity in developing new products can be slowed when approval is required at every step," he says. "Operating with QRM principles implies trust and using one's own judgment, enabling us to design, create, and get new products to market five times faster than our competitors."

Reflecting on the old way — the need for approval at every step — Bendre notes, "It's harder to innovate and experiment when you smother the process."

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### **Time as unifying force**

Copp points out the simplicity of using velocity — time — as a unifying principle that's easy to understand and to identify with: "We have a diverse workforce representing different cultures and varying educational levels. Whether in one's personal or work life, we all understand and can relate to the concept of time. At TCI, we work every day at finding ways to take time out of our processes."

In addition to all-employee meetings, which are conducted monthly for each of TCI's three shifts, a box in the lunchroom invites questions. It's not unusual to find suggestions for taking time out of a process, and it's not unusual for, if not full acceptance, at least thorough examination of a proposal or a what-would-happen-if-we-tweaked-it-and-did-this-instead query.

"People see this as an extension of our core values," says Director of Operations Paul Martens. "We act on or at least respond to every suggestion. Our employees stay engaged and are always thinking about quality, time, and the customer experience."

TCI's overall response time has shrunk from 25 days to two days, and all of it has been accomplished through process change rather than capital investment.

The result: continuous improvements in quality, efficiency, cost, delivery, and business system velocity that have yielded expanded market share, higher profits — and delighted customers.

### **Time as competitive advantage**

Although the impetus for launching a QRM initiative 20-plus years ago was to retain a single major customer, TCI has come to understand — and to bear witness to — the correlation between reducing time and reducing costs. Empirically, for every 3% reduction of time in a process, there is a 1% reduction in cost ("Power of Six Rule" described in Tubino and Suri, 2000).

Since adopting QRM in 1995, TCI has expanded its application of QRM and narrowed its organizational focus to one central thought: extracting time wherever possible to increase business velocity. QRM evolved at TCI from an operational tactic to an omnipresent element of every strategic initiative.

"We don't just *think* QRM; we *live* QRM," Copp says, adding, "We've created a dynamic workforce with the capacity to match real-time demand. TCI's business velocity has created a barrier that neither domestic nor offshore competition can penetrate."



*Paul Martens, Director of Operations*



### Product Lead Times

Receipt of customer P.O. to product shipment reduced 70-92%

On-time delivery sustained at 99-100%

### Business Process Lead Times

New-employee training time reduced 67%

Management decision-making time reduced 75%



*Operators in a cell wind coil for small line reactors.*



*Small line reactors in their final stage: varnish, bake and clean.*

And it happened with minimal capital investment. Designing and moving into a new, larger facility in May 2014 was TCI's response to a need for more space required by the company's success. "We were landlocked at our other plant," Copp notes. "We now have 66,000 square feet and a lot of room for growth."

Sobczak adds, "The new facility has also allowed TCI to re-evaluate how it was servicing customers and markets. With limited strategic inventory investment, combined with delayed differentiation across several product families, TCI reduced response times an additional 50%. TCI continues to evolve and improve its business model, using time and business velocity as a competitive advantage."

QRM is the guiding star that has led this 56-year-old company through a transformation: It went from a functional organization with top-down

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**"We don't just *think* QRM;  
we *live* QRM."**

**— Steve Copp, Chairman  
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management control and narrowly specialized employees geared to achieving efficiency and utilization goals, to a cellular organization with team ownership of processes completed by cross-trained employees with a relentless focus on lead-time reduction.

TCI's growth and profitability bear witness to the success of the QRM philosophy.

And what might the future hold for TCI?

A core belief permeates the company and brings excitement to every new workday: To continue to focus on increasing business velocity and extract time from TCI's business system, no matter what its future product or service offerings might be. Rapid, reliable delivery will keep TCI and its customers in a position to dominate their markets.

## Center for Quick Response Manufacturing (QRM)

Established in 1993, the Center for Quick Response Manufacturing at the University of Wisconsin-Madison is a partnership between industry, faculty and students dedicated to the development and implementation of lead time reduction principles.

For over two decades, the QRM Center has helped more than 250 companies of varying sizes from a wide array of industries reduce lead times in all aspects of their operations and become more competitive in the global marketplace. The Center can point to an impressive track record, with several member companies realizing lead time reductions exceeding 80%, cost reductions of up to 30%, and on-time delivery improvements of over 99%.



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