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Summer 1999

K&A Crylics looks to new technology in planning its future

With 65 employees, K&A Crylics is just about the biggest thing going in Wartrace, Tennessee. And it's poised to get just a little bit bigger very soon. Recently added equipment and floor space at K&A are laying the foundation for growth in product development, sales and customer service.

K&A Crylics designs and manufactures custom displays and store fixtures from several types of plastic, including acrylic, high impact acrylic, styrene, polycarbonate and PVC board, among others. Often wood, metal and other materials are designed into the products to create special, one-of-a-



Chris Shiflett adjusts a sheet of acrylic on K&A Crylic's new laser in preparation for it to cut and finish a product.

kind displays.

Many of K&A's customers are large, national retailers. They do business with K&A because of the high quality of its products, but they also expect a very high level of service. Not only

does K&A often have to complete orders and schedule shipping to accommodate events such as multi-store openings and new product introductions, many customers are now asking for inventory storage and management too.

Because of this customer need, K&A recently completed a 12,000 square foot facility addition that houses customer products and can be used for expansion of production facilities when needed.

"Our customers expect us to carry their display inventory and ship direct to retail locations," said

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- **Web sites for fun and profit**
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K&A vice president Kevin Wright. "We saw this as an opportunity to better serve our customers while giving us the extra space we'll need to expand our business."



Vice president of manufacturing Noel Johnson discusses some of the steps K&A Crylics has taken in the last year to keep its customers satisfied and prepare for the company's future. In addition to launching a new product line, K&A has installed new computer hardware and software to assure Y2K compliance and commissioned a detailed time study from the TMEP to insure accurate estimating and scheduling.

On the drawing board: a new venture

In addition to storing customer product, the new space also will be used to store inventory for K&A's new product line that is now under development. And that new product line represents the source of much of the company's anticipated growth.

Currently, K&A manufactures a few

lecterns and podiums that are sold to churches and other organizations, but most of its output is custom, made-to-order.

The strategy of adding various new product lines of their own design was one significant factor that prompted the recent purchase of a Hendrick/eurolaser, which was selected with the assistance of TMEP laser specialist Mike Sharp of UT's Space Institute.

The new laser is not only opening doors to new market opportunities, it also will make a big difference to K&A's existing business.

"We justified the laser purchase based on our current production needs," said K&A vice president of manufacturing Noel Johnson. "But it's also the final resource we needed to be ready to manufacture and sell our own products."

At a cost of about \$160,000 the laser wasn't cheap, but it should pay for itself fairly quickly.

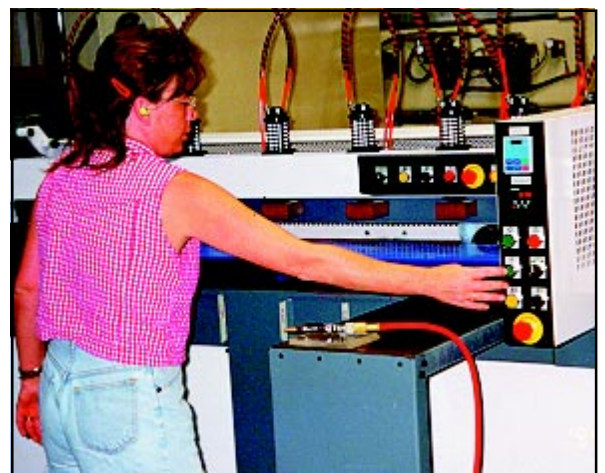
"We were outsourcing all of our laser work, and we had to go quite a distance outside Tennessee to find companies that had experience with plastics and that could give us the quality we demand," said Johnson. Plus, he added, they were buying laser-cut pieces such as plastic letters, trophy components, engraved signage and plastic mechanical parts that they will now be able to make in-house quickly and inexpensively using the laser.

The laser operator simply scans the product design, including any words or artwork to be etched on the piece, into the laser's computer, tells the computer what type and thickness of material is being used, loads the plastic sheet onto the machine, and monitors while the laser does the cutting and finishing work. Complicated designs with multiple curves or finely detailed outlines are no problem. "It works just like a printer plotter, and the scanning and programming involved are much simpler than with the CNC machines," said Johnson. And, according to Johnson, it can now be more efficient to produce small quantities of some items without the expense of set-up and programming.

Plus, it's fast. In a demonstration, it took less than five minutes using the "artwork" from a business card to create a perfect one-quarter inch thick company logo in clear acrylic.

The new laser, along with a second newly purchased CNC router and a second diamond polisher, give K&A all the production resources it needs to keep up with customer orders and add the new production without straining capacity in its existing departments.

Addition of the new equipment and product line also means K&A will be able to maintain a stable workforce. And that's important to the company's owners. They located K&A in Wartrace 20 years ago because they enjoy the quality of life there, and they're committed to making K&A an asset to the community. Having its own product line should assure that K&A remains a community treasure for years to come. ■



Lori Keown lines up acrylic parts on one of K&A's new diamond finishers. This machine polishes edges to a clear, smooth, mirror-like finish prior to final product fabrication.

ISO 9000: 2000 – Revising the Quality Standards

With the International Organization for Standardization overhauling its quality assurance standards in late 2000, here's a preview of likely revisions to help you prepare.

Before getting into the proposed changes to the standards, let's look briefly at the ISO 9000 family "ISO 9000: 1994," so-called because that's the year of the last revision. From a technical standpoint, ISO 9000 is an internationally accepted set of guidelines for quality assurance. From a practical standpoint, ISO 9000 is a collection of good business practices—things that companies probably ought to be doing anyway. Since the series was first published in 1987, the family has proliferated to 20 standards and supporting documents.

In a move to make the standards more generic and provide a stronger customer focus, ISO is reducing its current family to a handful of core standards. ISO 9001 (Quality management systems – Requirements) will replace ISO 9002 and ISO 9003 and incorporate portions of those two standards into its new structure. As such, ISO 9001: 2000 will be the only "member" of the family to which a company can become certified.

The new ISO 9004 (Quality management systems – Guidelines) will encompass quality management principles, and it is intended to lead to the development of a comprehensive quality management system. And, finally, the current quality vocabulary standard will become ISO 9000, and it will introduce new concepts and terminology as well as revised definitions.

Changing the name of ISO 9001 from "Quality assurance – Requirements" to "Quality system – Requirements" means that ISO is adopting a more business-oriented approach. With its new process-based structure, ISO 9001 will apply quality standards not to products, *per se*, but to management systems. In this way, the new standards will be broad enough to satisfy the requirements of service industries such as banking and health care.

The change may require some companies to modify their ISO certification. For example, the present ISO 9002, a subset of ISO 9001, does not include the design control requirements of ISO

9001. If your company is registered to ISO 9002, you will likely need to replace your existing certificate with one "tailored" to the new International Standard. The new certificate would indicate which activities in your organization are not applicable to ISO 9001: 2000.

Some radical differences

In summer 1998, drafts of ISO 9001 and ISO 9004 were issued that differ radically from the 1994 versions. The fundamental purpose of the standards—to serve as generic models for quality—is still the cornerstone of the ISO 9000 family, but the orientation and structure of the two standards have changed. As a start, there will be a greater emphasis on customer satisfaction.

More than 11,000 of the approximately 223,000 organizations that use the standards were asked for recommendations for improvement. The responses included making ISO 9001 easier to understand, making it compatible with environmental management systems (the ISO 14000 series), being more applicable to organizations outside manufacturing, connecting quality management systems to business processes and addressing customer satisfaction and continuous improvement.

The job of the committee revising ISO 9001 was to devise a structure that would incorporate and enhance these requirements. What they came up with was a "process-based model."

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FOR MORE INFORMATION:

American National Standards Institute (www.ansi.org) has added a Standards Alert Service to its website.

American Society for Quality (www.asq.org) provides information on the ISO 9000 and ISO 14000 standards, QS 9000 requirements and ASQ certification programs.

ISO Online (www.iso.ch/) features updates and news articles on ISO 9000 and other International Standards.

"What seems clear at this point is there will be a requirement for continuous improvement. Companies will need to determine how to collect customer satisfaction data and how to use that information to improve their quality management services and customer satisfaction levels."

The October 1998 issue of *Quality Digest* featured "ISO 9000 in 2000," by Jim Mroz (www.qualitydigest.com/currentmag/html/past98.html).

Columns and articles on ISO 9000 appear regularly in *Quality Magazine*.

Contact the TMEP for assistance about ISO, QS or any matters related to manufacturing quality. Just call (615) 532-8657 in the Nashville area or toll-free (888) 763-7439.

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The new process-based model

The process-based model differs from the present ISO structure in that it is integrated vertically *and* horizontally. The internal activities of an organization will be arranged vertically by the four major clauses of ISO 9001. Management Responsibility (Clause 5) and Resource Management (Clause 6) lead to and influence Process Management (Clause 7), which relates directly to the customer both through the input phase and through the output or delivery of a product or service. Customer feedback connects back to the fourth major clause — Measurement, Analysis, and Improvement (Clause 8)— which then circles back throughout the organization through yet another loop—the Plan, Do, Check, Act cycle. (Figure 1 illustrates the process approach.)

Remember that ISO 9001: 2000 is still at a preliminary stage, but the most recent committee draft (CD 2) “maps,” or annotates, the current 20 requirements to the new four-clause structure. Because some companies use flow-chart software and matrices to show how their documentation systems comply with the present ISO 9001 requirements, software companies likely will keep up with the changes to the standards. Also, the Organization will develop guidance to reduce conflict and confusion, but that guidance is not immediately forthcoming.

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a requirement for continuous improvement. Companies will need to determine how to collect customer satisfaction data and how to use that information to improve their quality management services and customer satisfaction levels.

Some wording in the present draft suggests the possibility of other new requirements. These ambiguities will be addressed in the next draft. It is hoped that the next committee draft will list items that are considered new and those that are considered to be interpretations of the 1994 version. Publication of the final revised International Standard is expected late in the year 2000.

Certify now or wait?

If your company has been considering ISO certification, you may wonder if you should you hold off until the revisions are completed. Since you can “map” the new requirements to the current standard, there really is no need to wait. If your customers are pressing you, by all means start the process, and become as knowledgeable about ISO as you can.

If your company is already registered, you may want to have your internal auditor review the current ISO draft — and successive versions — to keep up with the changes. You can purchase a copy from the American Society for Quality (at www.asq.org or call 800-248-1946). And, at your next surveillance audit, ask the auditor if there are ways you might improve your process management in anticipation of the proposed changes. ■

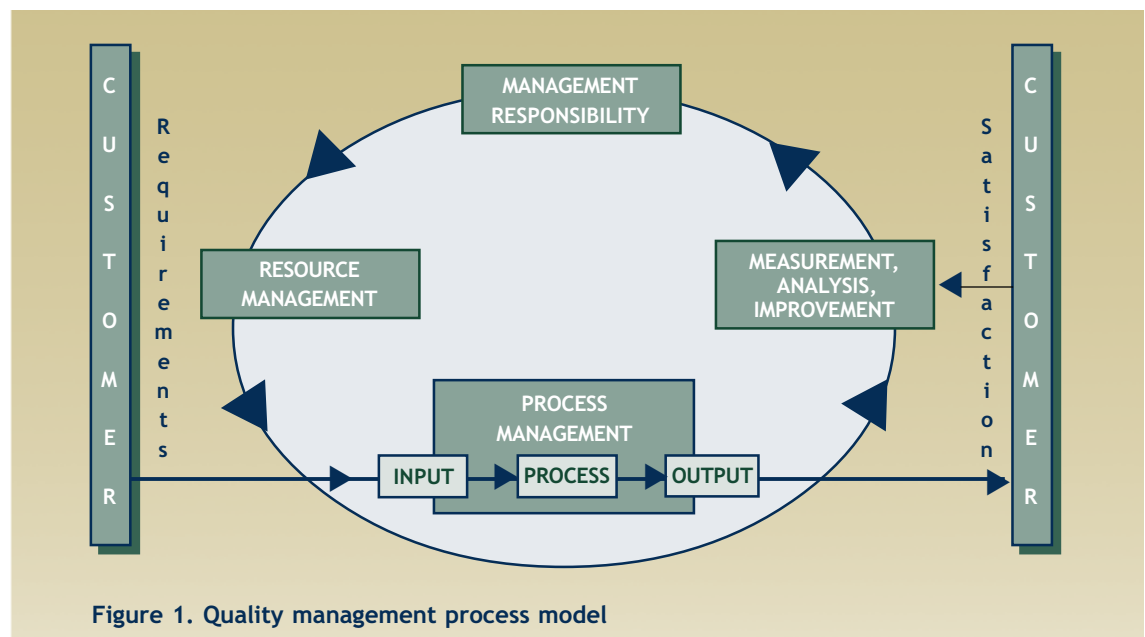


Figure 1. Quality management process model

Put the U.S. Space Program to work for your company

You probably thought you'd never see the day when the federal government would give your company—for free—the blueprints for cutting-edge new products that you can manufacture and sell. But, that just about sums up NASA's technology transfer program.

The University of Tennessee Center for Industrial Services is helping Tennessee companies acquire, manufacture and market for sale all sorts of inventions and technologies that originated at NASA. Many of the products are free, and others can be licensed for relatively small fees. All are available only to U.S. companies.

What is a NASA technology?

Just as in most manufacturing plants, NASA engineers have to devise methods to solve their production problems. Sometimes they can build on existing technology, but other times, they have to create something brand new.

For example, NASA had monitored manually the accumulation of potentially damaging dust and fibers on sensitive payload components. It was determined that they needed an automatic system that could provide real-time fallout records. The system they developed is not only an excellent fallout detector but has proved effective in monitoring motion and other activities. In its current configuration, this system:

- Records particle accumulation in real time so as to correlate with outside events
- Operates on an internal battery, independent of facility power supply
- Stores 32K bytes of data in its memory
- Lets the user set sampling intervals
- Is inexpensive compared with equipment of comparable sensitivity

Commercial uses for this product could include security systems based on motion detection, clean room monitoring and patient monitoring. All it needs is a manufacturer to take it over.

In another instance, NASA mechanics needed a wrench that could be used to tighten electrical cable retainer nuts, located in very confined areas, on the Space Shuttle Solid Rocket Boosters. To

A sample project: Space Shuttle insulation now cooling off the NASCAR circuit

Thermal insulation blankets developed for use aboard the Space Shuttle are now protecting race car drivers against excessive cockpit heating. BSR-TPS Products Inc. of Mooresville, North Carolina, manufactures Thermal Protection System (TPS) materials for NASCAR drivers as a result of an agreement with Boeing North America, participating as a NASA Kennedy Space Center contractor.

NASA's Space Shuttle Orbiters are subject to re-entry heat loads as high as 3,000 degrees Fahrenheit and are equipped with TPS tiles and thermal blankets to safeguard against excessive heat upon re-entry. The idea of using TPS materials to insulate against heat in the cockpit of a race car came about as a result of a tour taken by NASCAR champion Bobby Allison at Kennedy Space Center. Former Center Director Jay Honeycutt suggested that TPS insulation materials could shield drivers from the internal high temperature of race cars. Allison contacted Roger Penske, who provided a race car in which the TPS insulation was installed. The TPS material was found to significantly reduce cockpit temperatures and the chance of serious injury to race car drivers.

The BSR-TPS product is the first commercial use of Shuttle TPS insulation. The original insulation blankets tested at Daytona worked well and were state-of-the-art from a thermal standpoint, but they were not durable enough for the racing environment. BSR changed the

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solve this problem, they invented a torque wrench adapter. This device:

- Provides a means to accurately torque spanner nuts in confined spaces not accessible by conventional torquing tools
- Saves time in troubleshooting connectors in confined areas
- Requires no maintenance
- Is simple and reliable and can last indefinitely

The specifications for this tool are free. All you have to do to receive them is complete a simple technology transfer form. There is no limit on the use, reproduction or sale of this wrench adapter. ■

Currently, there are more than 25 NASA inventions available from the Kennedy and Stennis Space Centers. To request a list of them, call Kathy Ellis at 423-974-3018 or send e-mail to ellisk@utk.edu.

Mighty Equipment makes some big changes, one small step at a time

Early this year, the folks at Mighty Equipment in Centerville called on the TMEP for information about employee training. But when they discovered



Quality manager Randy Hardy demonstrates one of his company's mortar mixers. Mighty Equipment also makes special climbing scaffolding and other equipment used by masonry contractors.

all the other TMEP services available, training quickly took a back seat.

Since the first of 1999, the TMEP has completed several small projects for Mighty Equipment (ME) that are leading to significant changes throughout the plant.

One of the first contacts with the TMEP

was through an operations assessment conducted by TMEP manufacturing specialist Jim Ross. Ross spent some time in the plant, following materials as they went through the production process and talking to workers about how they did their jobs. The result was a report that contained 26 suggestions for improvement.

Rather than being surprised, says quality manager Randy Hardy, they were very pleased to see where Ross found opportunities for change because it paralleled their own thinking.

"We had come up with many of the same ideas Mr. Ross did," said Hardy. "But it really helped to have a third-party, outside opinion to validate our thoughts."

Among Ross's suggestions was the creation of a Kanban system which Hardy has implemented in the welding department. He developed special containers that hold all the parts for a specific

process. Now, the workers have everything they need at one time, in one place. An empty container signals the need for a replacement, which is already full and ready to go.

Another change was the design of work cells dedicated to high volume products and flexible cells for low volume items.

"Before we had the cells, it wasn't always easy to balance the work flow," said Hardy. "Now we can keep the low volume production area busy by making a few of each of the hundreds of little accessories that can go on scaffolding, and the other production lines aren't affected."

The TMEP environmental, health and safety group also has been at work in Centerville. Of note is the suggestion from TMEP environmental consultant Don Stone to have ME's paint vendor use a different thinner. This small modification helped Mighty Equipment avoid the large hassle of obtaining a Title V air permit.

Hardy says the TMEP has brought his company ideas that are changing the way they do business. "The TMEP is a huge asset," he said. "I recommend them to anyone who wants to take a fresh look at their business." ■

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materials (to metal, ceramic and glass) to increase durability and reduce cost but left the fundamental design unchanged. The blanket is less than one-half inch thick, yet it is a highly efficient thermal-radiation shield. To prevent overheating of exhaust pipes, the blanket is installed only over the top of the system, leaving the bottom exposed to airflow.

Tests conducted at the Daytona Speedway showed significant temperature decreases in locations where the kits were installed. The exhaust pipes are routed so close to the sheet metal of the floor pan and transmission tunnel that a large portion of the heat radiated by the exhaust system enters the cockpit. A driver can sustain localized second- or third-degree burns. The insulating blanket kits manufactured by BSR-TPS Products lower temperatures by more than 40 degrees in the cockpit. The blankets are lightweight and provide maximum thermal protection to the driver in the event of a collision or fire.

Accordingg to BSR-TPS Products, more than 90 cars and trucks in three different NASCAR series are using the TSP insulation kits. BSR-TPS is now introducing the kits to the Sports Car Club of America, Offroad series, and to airplane manufacturers. TPS products also are being developed for the Experimental Aircraft Association.

If you'd like a TMEP manufacturing specialist to take a look at your operation, just call us. (615) 532-8657 or toll free (888) 763-7439

There's nothing you can't find on the web

Here are a few websites that offer something for just about anyone who works in a small business:

www.businessplans.org

The Center for Business Planning provides business managers and entrepreneurs with resources to help create and manage a business. Information is provided on every aspect of planning a business, including acquiring venture capital, defining new products, market analysis, competitive analysis, production management, tax problems, legal issues, preparing financial statements, writing a business plan and more.

www.justsell.com

Lots of resources and articles for those who are involved in sales and/or marketing. Includes a special section for "non-sales" professionals.

www.gettingstarted.net

If you've ever wanted to build your own website, this is a great place to begin. Provides instruction for both novices and experts with interactive practice sessions.

www.uspto.gov/web/offices/tac/doc/basics/toc.html

Everything you need to know about trademarks, including the required forms to submit for trademark protection. From the U.S. Patent and Trademark Office.

www.nesnet.com/nesnet/salary.html

1999 Engineering Salary Survey from National Engineering Search. Also provides personalized salary survey based on individual education, experience, industry and geographic region.

www.itools.com/research-it/research-it.html

Lots of research tools including dictionaries, language translators, currency translators, package tracking, even the *CIA Factbook* on foreign countries.

CALENDAR

"Producing and Using Wood 1999: How to increase yield, reduce waste & recover value from the wood resource," October 12-13, 1999, Holiday Inn World's Fair, Knoxville. This conference, designed for anyone who has a stake in a wood industry, will help you get the most value out of wood—both at the front end, from log to finished product—and at the back end, recovering and using the leftovers.

In addition to exhibits showcasing state-of-the-art equipment and technology, the conference features two field trips and more than two dozen presentations. Keynote speakers are Dr. Fred Cabbage, head of the department of forestry at North Carolina State University, and Jerry Goldstein, editor of *Biocycle*.

Co-sponsors include UT's Center for Industrial Services, the Tennessee Forest Products Center, the U.S. EPA, TDEC, and the Tennessee Forestry Association.

The registration fee of \$195 (\$99 for one day) includes presentations, lunches, breaks and an evening reception. For more information, call (615) 532-8657, or register on the Internet at www.cis.utk.edu.

OSH Outreach Training. Two trainer courses in occupational safety and health will be held in Nashville August 16-20. They are OTI 500 for the construction industry and OTI 501 for general industry. Both courses, conducted by staff from the OSHA training institute at Georgia Tech, will qualify you to teach OSHA safety courses. For more information, contact Georgia Tech at (404) 894-2547.

"Y2K Action Planning Workshops." The TMEP offers a simple computer program that walks you through Y2K planning in four steps. You'll leave this workshop with the tools, know-how and confidence to lead your company to a Y2K solution. Visit www.cis.utk.edu for a current schedule of Y2K workshops, or contact the TMEP at (615) 532-8657 or (888) 763-7439. Or, send e-mail to TY2K@utk.edu.

The TMEP offers numerous courses on topics such as team building, leadership and supervisory skills, and environmental and safety compliance. Call (615) 532-8657 for course catalogs, or visit our web site at www.cis.utk.edu for more information.

Focus On Manufacturing is published quarterly by the Tennessee Manufacturing Extension Program (TMEP), Tennessee's industrial extension service. The TMEP is a joint program of The University of Tennessee Center for Industrial Services and the Tennessee Department of Economic and Community Development.



A NIST MEP network affiliate

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E-commerce presents big challenge to small firms

Small companies that want to be part of the booming world of e-commerce must master a whole new set of skills, says Keith Rhodes, director of the General Accounting Office's Office of Computer and Information Technology Assessment. Companies must not only be adroit at the normal business functions such as payroll, supply distribution, advertising, marketing, capital investment and employee relations, but must also address a new set of complex and difficult questions regarding their Internet strategy.

New skills revolving around computer security, computer literacy and speed of response must now be mastered. Yet only 10 percent of small businesses have a web site and only 32 percent of small businesses have access to the Internet, says Christopher Bond, chairman of the Senate Committee on Small Business. Such figures "suggest both a disconnect and, at the same time, an incredible opportunity for main street America."

If a company wants to expand its operations via the Internet it must be able to "translate normal business requirements into Internet requirements, which are computer requirements," says Rhodes. "Governments and businesses do not do a good job of establishing their computer requirements even when they are not building an Internet presence for themselves; thus, this is not a trivial matter."

The time and money spent on building an excellent Web site could be spent on marketing endeavors. Moreover, Web users are becoming more savvy and expect a Web site to have all the latest bells and whistles,

such as graphics, video and sound. As a result, companies must stay abreast of the latest Web technologies. New questions must now be answered by small firms:

- Will the site be used simply for advertising and marketing, or is it an actual point of sale?
- Is the business going to manage its suppliers and distributors via the Internet, or will traditional voice and fax systems be maintained?
- How much data is necessary to understand who is using the Web site?
- What happens if success comes much faster than expected?
- Do you want to reach a global Internet customer base, which is growing at a much faster rate than in America? If so, do you need to have different languages on your site?
- Is your host computer powerful enough to handle a lot of traffic to your site?
- Can you help your customers who are having difficulty accessing the site or who have questions?
- How do you handle security on your site?
- With credit card fraud increasing by 600 percent on the Internet since 1997, how *much* security will you provide your customers? "The more the Internet business can calm the fears of the potential buyer, the more likely the business will survive," says Rhodes, who can be reached at (202) 512-6412. ■

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TMEP electronic commerce specialists are ready to help you prepare for the challenges of e-commerce. For more information, call us at (615) 532-8657 or toll free at (888) 763-7439.