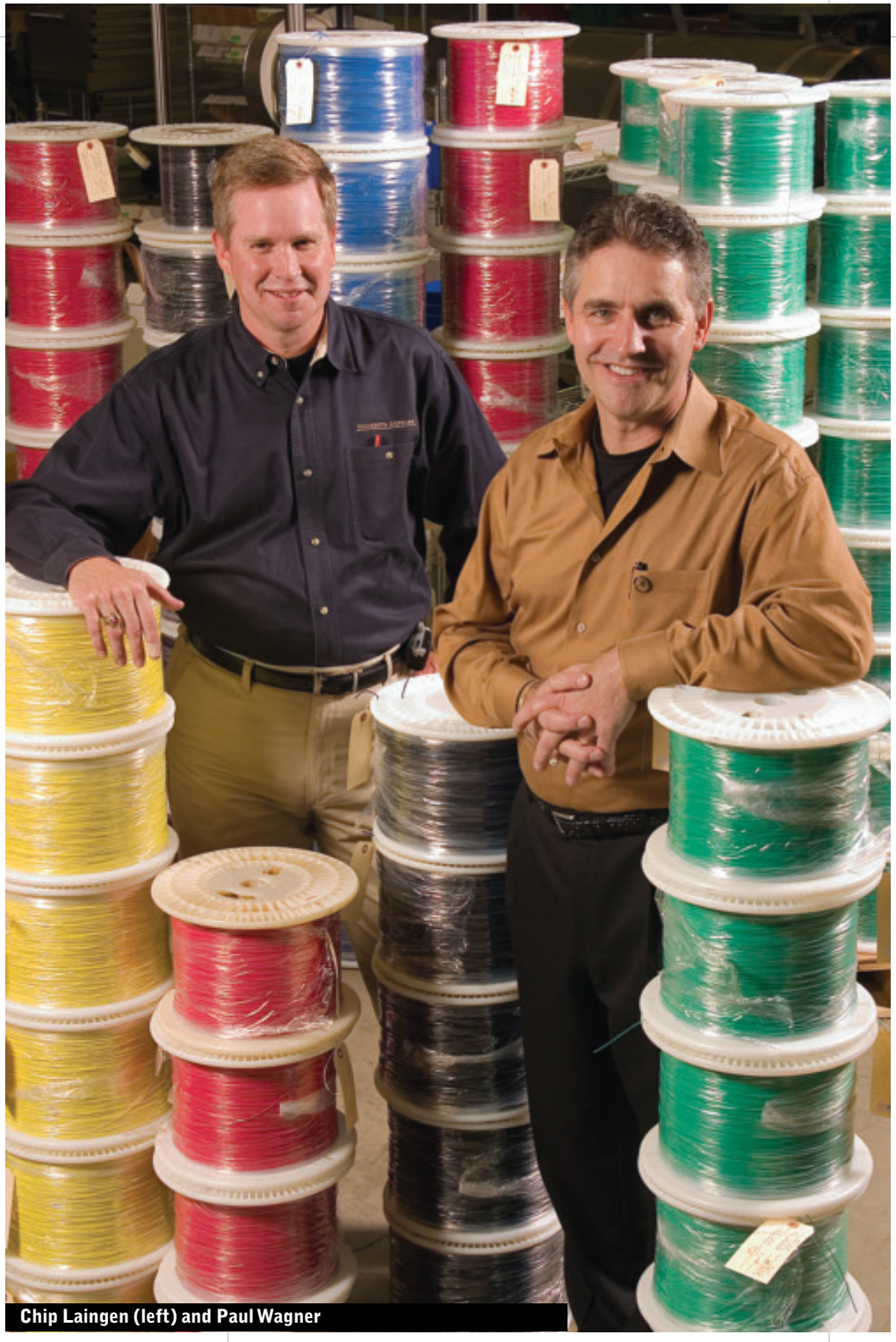
Heartland Security

More and more Minnesota companies are developing technologies and products for homeland security purposes—and sharing their know-how so others can join the effort.

By Jenny Sherman
Photographs by Sara Jorde



Chip Laingen (left) and Paul Wagner

In the summer of 1984, doctors and hospitals in Wasco County, Ore., were inundated with scores of patients suffering from a strange medley of symptoms, including nausea, fever, diarrhea, and intense headaches. As the number of people affected grew to more than 700, researchers determined the cause: food poisoning. The outbreak was due to some bad eggs, of a sort: The infectious agent, Salmonella bacteria, was intentionally scattered on the salad bars of several restaurants in the Oregon town of The Dalles by members of the Rajneeshee cult, who were at odds with local government officials. No one died, but it took a year to trace the cause of the outbreak.

Had Bob Havrilak been working on it 20 years earlier, his Triangle Risk Assessment Process software program might have prevented the incident altogether. The program, called TRAP-IT, assesses the vulnerabilities of restaurants, grocery stores, manufacturing plants, and others in the food industry.

"The TRAP-IT program is to food defense planning what Turbo Tax is to financial planning," says Havrilak, the CEO of TRAP-IT Security and principal engineer of Service Engineering Group of St. Paul, which has invested more than $1 million into the program's development. Users input data about their facilities, processes, and resources, and the program churns out an analysis of risks and ways to avoid them.

"What concerns the food industry and the government is, in the case of a food attack, the ramifications for consumers," he says. "What would happen if someone decided to—or even threatened to—wipe out the grain crop in the United States?"

"What if?" is the question that has been asked by more and more Minnesota companies and institutions in the days since Sept. 11, 2001. Many are coming up with answers by leveraging their expertise in areas as diverse as facial recognition technologies and wearable defibrillators to benefit national security needs. Don't think your business has anything to offer for national security? Think again. By looking at the various ways the government solicits proposals, and how companies have pitched their products to other organizations in the security industry, you too could land a lucrative deal.

SPREAD THE WEALTH

The defense industry is not new to Minnesota. During WWII, wood products manufacturer Villaume Industries of St. Paul produced wooden gliders, ammunition boxes, and K Ration boxes for the war effort. Today, several major defense players (called prime contractors in government-speak) have Minnesota operations, including BAE Systems, Lockheed Martin, and General Dynamics.

Start Smart

WHERE TO FIND INFORMATION ON HOMELAND SECURITY PROJECTS.

- www.dhs.gov—U.S. Department of Homeland Security
- www.hsarpasbir.com—U.S. Homeland Security Advanced Research Projects Agency
- www.nationalhomelandsecurityknowledgebase.com --a resource for homeland security-related news, business opportunities, directories, and links
- www.biobizmn.org—a public-private business development partnership advocating Minnesota's biosciences industry
- www.hsianet.org—Web site of the Homeland Security Industries Association, a nonprofit corporation connecting government and the private sector on homeland security issues
- www.ndia.org—Web site of the National Defense Industrial Association, which conducts programs to inform members about national security and the industrial base
- www.ncfpd.umn.edu—National Center for Food Protection and Defense at the University of Minnesota
- www.gsa.gov—U.S. General Services Administration, which facilitates the federal government's procurement of products and services
- www.deed.state.mn.us—Minnesota Department of Employment and Economic Development (DEED) and its SBIR/STTR resource center
- www.defensealliance.com—Defense Alliance of Minnesota
- www.zyn.com/sbir—site that features a calendar of seminars, listing of openings for submissions, and government agency links for SBIR/STTR program grants
- www.sbirworld.com—site that features SBIR/STTR information, calendars, PowerPoint presentations, and more
- www.ssti.org—the State Science & Technology Institute, a national network of practitioners and policymakers working to improve the economy through science and technology
- www.nitrd.gov/pubs—the National Coordination Office for Networking and Information Technology Research and Development, a source of timely, high-quality, in-depth information on IT research and development accomplishments, directions, challenges, and funding directions
- www.nta.org—the National Technology Alliance and its offshoot, the Chemical, Biological, and Radiological Technology Alliance, which is headed by 3M
- www.fedbizopps.gov—a U.S. government site in which federal product and services solicitations are consolidated and published
- www.dla.mil/db/procurem.htm—the DoD Procurement Technical Assistance Program, which features links to local resources that help businesses market products and services to the federal, state, and local governments
- www.tswg.gov/tswg/home/home.htm—the Technical Support Working Group, which identifies and coordinates research and development on terrorism

–J.S.

What is new, however, is scope of the burgeoning homeland security arena and the amount of money involved. The U.S. Department of Homeland Security (DHS) coordinates the activities of 22 federal agencies, in efforts as diverse as Coast Guard patrols, storm relief, preventing identity theft, and protecting municipal water supplies. It has the fastest-growing budget in the federal government. During 2005, Minnesota got a slice of the agency's $33.8 billion discretionary budget, receiving $35,311,099 in homeland security grants.

So how can you get a piece of that pie? It depends on whether you have an existing product or technology that could be in demand, or an idea for a product or technology the government needs.

Companies wishing to sell existing wares to federal agencies should read up on the U.S. General Services Administration (GSA), which buys supplies, equipment, IT solutions, and services that are termed "commercial off-the-shelf" products. Contracting opportunities worth more than $25,000 are advertised on FedBizOpps.gov, a clearinghouse for government buyers to solicit contracting offers. Before you start bidding, however, you'll have to register for a nine-character identification number, known as a D-U-N-S Number, which is required of all companies doing business with the U.S. government.

The Department of Defense's Procurement Technical Assistance Program (PTAP) is an entity that offers businesses help in marketing products and services to federal, state, and local governments; the Minnesota PTAP branch is run through MEDA: The Metropolitan Economic Development Association. The National Technology Alliance also acts as a matchmaker between commercial industry, academic institutions, and the U.S. government.

TAKE IT FOR GRANTED

Many homeland security solutions, though, aren't readily available "off the shelf." In fact, staying ahead of the security game generally means being first on the playing field by creating state-of-the-art technologies and products. Grants distributed by DHS and other agencies are focused on cultivating new scientific and technological resources to prevent or reduce the impact of future attacks. In fact, DHS's research and development arm, the U.S. Homeland Security Advanced Research Projects Agency (HSARPA), is charged with the mission of partnering with industry, universities, and other government agencies to rapidly develop prototypes and adapt new technologies for DHS purposes.

HSARPA recently selected Adventium Labs of Minneapolis, a nonprofit research firm, and 3Com Corp., a Marlborough, Mass., company that commercializes Adventium's ideas, for a two-year grant. The money will fund Adventium's development of virtual private groups to be added to the 3Com Embedded Firewall network security technology. The goal is to upgrade cyber security technology to protect essential systems controlling infrastructure such as water treatment, power, and transportation.

"Much of the critical infrastructure in the U.S. is owned by private industry," says Brian Isle, chief of operations and a member of Adventium's technical staff. "Almost all have some form of [Internet-connected] control system running them,

Deborah Yungner

and all of those are susceptible to cyber attacks. DHS has become very concerned about infrastructure susceptibility. This technology is meant to make systems more robust and secure."

Another option: the Small Business Innovation Research/Small Business Technology Transfer program (SBIR/STTR). It was created to help small companies come up with innovative solutions to federal research and development needs—and to later adapt them for commercial uses, termed "dual use." In fact, Apple Computer and Symantec, maker of Norton security software, started out through SBIR/STTR.

Since 1984, Minnesota companies have garnered more than $250 million in SBIR/STTR funding. Awards offer up to $100,000 for first-stage feasibility research (termed Phase I) and up to $750,000 for the prototype research-and-development stage (Phase II). But applying for SBIR/STTR grants is no walk in the park. On average, only 15 percent of Phase I applicants win grants for funding. Of those winners who later submit a Phase II proposal, 40 percent win further funding.

Numerous observers point out that getting that funding isn't always easy, however. The process is time consuming and extremely competitive. In that sense, it pays to do your homework: Go to conferences and symposiums, check out scientific literature reviews, and read white papers. Learn who the prime contractors are in specific industry niches.

Businesses can also seek guidance from the Minnesota Department of Employment and Economic Development (DEED). Betsy Lulfs, director of DEED's Minnesota SBIR/STTR Assistance Program, takes a hands-on approach to help early-stage technology companies with navigating the grant-writing waters, matching companies to appropriate topics, connecting them with the right federal agency, helping put together a company's research team, running grant-writing workshops, and even editing proposals.

"I have developed what I call a condensed version of the solicitation outline. It's in bullet form, and has everything [companies] need to include. I add everything I've learned over the years in between the lines," says Lulfs. She adds that one of her best tips is a disarmingly simple one: Read directions thoroughly. "It's amazing how many people don't follow directions."

DO THE MATH

Experienced grant writers can't stress enough how important it is to do preliminary research before sending in a proposal. For their HSARPA grant, Isle and his partner, Kyle Nelson, director of sponsored research and member of the firm's technical staff, had to do a good amount of background research to see if their idea would match what the agency was looking for. "It starts with what the government customer needs," says Nelson. "There are a lot of good sources on the Web. There are also industry day conferences people can attend."

Cautions Isle: "Without doing the homework, your chances of winning are almost zero. You need to be out there, need to know what the needs are. You need to be in the community, know who the players are, know what has been done before. And, of course, have a technical nugget that has value."

Being involved in your community includes taking a leadership position and contributing to the growth of your industry. As well as being a member of all major industry associations, Eden Prairie-based smart-identification card manufacturer

By the Numbers

- In 2001, the federal government spent $20 billion on homeland security activities; in 2005, it budgeted for $47 billion.
- The President's 2006 budget request includes $41.1 billion for the Department of Homeland Security.
- Minnesota ranks 24th in the nation in DoD contracting.
- The state's #10 defense contractor is Northwest Airlines; #5 is General Mills.
- More than $2 billion is awarded each year to small businesses through the SBIR program.
- 85 percent of critical infrastructure in the United States is owned by private industry.
- The global market for homeland security is predicted to grow to more than $170 billion by 2015.
- Minnesota ranks fourth in the nation for number of patents.
- In 2003, the U.S. government awarded more than $115 billion in IT-related contracts—a 91 percent increase from 2002.

–J.S.

CRACKING THE CODE

Government agencies often seem to be speaking in tongues. They're not, but their language abounds with acronyms.

BAA—Broad Agency Announcement

DARPA—Defense Advanced Research Projects Agency

DHS—Department of Homeland Security

DOD or DoD—Department of Defense

HSARPA—Homeland Security Advanced Research Projects Agency

HUBZone—Historically Underutilized Business Zone

NSF—National Science Foundation

SBIR—Small Business Innovation Research program

SOAC—Special Operations Acquisition Center

STTR—Small Business Technology Transfer program

–J.S.

Fargo Electronics shares its knowledge with the marketplace. "We do case studies, commentary in online and offline publications, and write white papers," says Director of Marketing Joe Wright. "It's time consuming—there's no immediate gratification. It took three or four years, but it's starting to pay off."

By getting its name out, in part, the company has scored contracts to supply approximately a dozen government agencies with its high-tech ID-card systems.

Partnerships can also be an excellent strategy. Shaun Kennedy at the University of Minnesota recognized that when he and his colleagues outlined a proposed collaboration with nearly 20 major public institutions, research facilities, consultants, state agencies, and professional organizations. The plan, submitted to DHS, won the U of M a $15 million grant to create the National Center for Food Protection and Defense—a Department of Homeland Security Center of Excellence intended to develop security measures to protect the nation's food supplies. "Resist the tendency to go it alone," advises Kennedy, the center's associate director. "If we would have gone in as the U of M alone, we wouldn't have gotten the grant."

BAND OF BROTHERS

Networking is essential when working with government sources. As in the private sector, a well-connected advisory board can open doors. Deborah Yungner, founder of Edina-based ERBUS Inc. (which stands for Emergency Response Backup Utility System), developed a trailer that acts as a sort of Swiss Army knife for disaster relief, containing potable purified water, electric power, filtered air, and communications devices. Despite garnering multiple awards at trade shows, Yungner found trouble connecting with potential government markets. So she went to her company's advisory board members, who lobbied for (and were granted) an audience and support from Minnesota Senator Norm Coleman. "Find people who are connected," she says. "Start with your trusted network of contacts. Look at who knows these types of people in the industry."

She also recommends making new contacts through professional organizations, such as a new state industry group called the Defense Alliance of Minnesota, a forum for those involved in the state's defense and homeland security industries. The Alliance offers information through its Web site, e-newsletters, and events such as its Defense Industry Roundtable, where Minnesota Senators Mark Dayton and Norm Coleman spoke in October. The Defense Alliance was started in 2004 by Chip Laingen, director of communications for St. Paul-based Minnesota Wire & Cable Co., when he looked for defense resources in the state and found virtually nothing. "A lot of people don't know the programs out there, about sharing high tech for homeland security," he says. "We've learned all these lessons and decided to share them with the community."

Those lessons came from Minnesota Wire & Cable's experience working with the government. Chairman Paul Wagner got a call one night from the Pentagon asking if he could save its Land Warrior program. The program, which was developing a wearable computer for soldiers, was 14 months behind schedule. Wagner crafted an SBIR proposal to adapt his firm's wearable medical monitoring systems for military use. The company won the grant and, after 552 hours of intense work, came up with a useable solution. It's been nabbing government contracts ever since, spawning a new division, Minnesota Defense. "We've picked up more than 30 defense contracts since we started the division, about $2.5 million in orders," says Wagner, who's hired a staff person specifically to write white papers and grants. Winning those grants and contracts has been rewarding in more ways than one. As Wagner puts it: "It's cool to save lives and make money at the same time."

Jenny Sherman is a New York City-based freelance writer.

Dates to Know

Jan. 18-19, 2006—Network Centric Warfare 2006, Washington, D.C.

Feb. 1-2, 2006—CBRN Defense, Arlington, Va.

Feb. 4-8, 2006—American Astronautical Society Guidance and Control Conference, Breckenridge, Colo.

Feb. 6-9, 2006—Components for Military and Space Electronics Conference & Exhibition, Los Angeles

Feb. 22-23, 2006—AFCEA Homeland Security Conference 2006, Washington, D.C.

March 7-9, 2006—FOSE, Washington, D.C.

March 28-30, 2006—Aviation Industry Expo, Las Vegas

April 9-12, 2006—BIO 2006, Chicago

April 18, 2006—Minnesota High Tech Association Spring Conference, Minneapolis

April 21, 2006—"Terrorist Threat to our Food Supply" National Symposium, National Center for Food Protection and Defense at the University of Minnesota, Minneapolis

April 26-27, 2006—GOVSEC US LAW READY! 2006, Washington, D.C.

May 15-18, 2006—National SBIR Spring 2006 Conference, Louisville, Ky.

May 15-18, 2006—GSA EXPO 2006, San Antonio

May 24, 2006—Defense Alliance of Minnesota Roundtable: "Battlefield Medical Technologies," Minneapolis

Aug. 29-31, 2006—AUVSI Unmanned Systems North America 2006, Orlando

Nov. 6-9, 2006—National SBIR Fall 2006 Conference, Milwaukee

–J.S.