

## LESSONS OF LEADERSHIP

# Working On The Railroad

By Michael Barrier

*Gene Harmon has built his father's "custom engineering firm" into a high-tech leader in a resurgent industry.*



PHOTO: © CHUCK KNEYSER—BLACK STAR

**A** few months ago, in Kansas City, Kan., lightning struck a pile of railroad ties at a factory near Kemper Arena. The blaze consumed 50,000 ties.

Reporters asked the owners of the ties how many millions of dollars had gone up in flames.

The puzzling answer: None.

"We didn't lose any money," says Robert E. "Gene" Harmon, "because the railroads are giving the ties to us. And the railroads didn't care, because their objective was to get rid of the ties. That was hard for the press to understand."

Every year, many thousands of wooden railroad ties wear out and must be replaced. Disposing of the old ties has turned into a major headache for the railroads, because the ties are soaked in creosote, a wood preservative. Burn the ties, and you pollute the

*The Harmons, Bob and Gene, view some of the railroad ties that Harmon Industries recycles at Kansas City.*

air; bury the ties, and you pollute the ground water.

Now the railroads have found a solution: Ship those old ties to that plant in Kansas City. The plant belongs to Cedrite Technologies, an 80-percent-owned subsidiary of Harmon Industries, a Blue Springs, Mo., company that manufactures products for the railroads. Gene Harmon, 50, is Harmon Industries' chairman, president, and chief executive officer.

Even after the fire, Cedrite had plenty of old ties left: about 120,000 of them, piled several stories high on five acres around the plant. Cedrite grinds the old ties into chips, mixes the chips with a proprietary resin, and pours the

mixture into 1-ton molds. Under 4 million pounds of pressure, 3 feet of chips are squeezed down to a height of 7 inches. The mold bakes in a huge oven for six hours and cools for two, and at the end, out pops a new railroad tie.

The new ties are much harder than wooden ties, and, at 270 pounds, 30 or 40 pounds heavier; from all indications, they will last a lot longer than wooden ties. Says Gene Harmon: "It's not very often that you get a chance to solve a major environmental problem and make some money doing it."

But as Harmon readily admits, Harmon Industries is not yet making money off the new ties, even though it has invested \$14 million in the Cedrite plant. Cedrite shipped its first ties to the Union Pacific railroad last July 31, but the lack of a critical piece of machinery has held production to one tie every two minutes; when the new ma-

## LESSONS OF LEADERSHIP

chinery is in place, production should rise to one tie every 40 seconds. "The process is proven," Gene Harmon says. "The question is whether we can build ties at a pace fast enough to recoup the capital cost of the plant."

The payoff for success will be large: Not only are railroads providing the ties (and shipping them to Cedrite) for free, but they have already placed or-

Robert C. "Bob" Harmon, founded the company in 1946, when he went into business in one corner of an upholstery shop in Independence, Mo.

Bob Harmon learned about radio while serving as a Marine in the 1930s, and during World War II he worked as an engineer for an electronics company. After the war, that company tried to move into civilian electronics, selling

fering with other uses of the lines, so that some central point could be notified about the hotbox; the engineer could then be warned, by radio.

But after almost 20 years, Harmon Electronics had become no more than what Gene Harmon calls a "custom engineering firm," skilled at finding solutions to problems but unable to translate those solutions into products that brought large, continuing sales. It was a company with about two dozen employees and less than \$1 million in annual revenues. That changed three years after Gene Harmon joined the company in 1961.

**T**he Harmons lived on a farm adjoining the Harmon Electronics plant in Grain Valley, Mo., and "from about 11 to 13 years old, I toyed with the idea of being a farmer," Gene recalls. He made \$435 from five acres of corn one summer, but the next summer, he put in 15 acres, there was a drought, and he made only \$34. That settled him on railroads as a career, and he went to work for Harmon Electronics after graduating from Georgia Tech.

In 1964, Gene was visiting at the Santa Fe headquarters in Chicago when he learned that the railroad badly wanted an improved electronic track circuit—essentially, a switch on the track that triggers a crossing gate and warning lights when a train crosses it. In those days, a crossing gate might not open to auto traffic until a train had gone 100 feet or more past it; the Santa Fe wanted the gate to open as soon as the train had cleared it by 5 feet.

Gene presented the specifications to his father and a staff designer, and, he recalls, "they both agreed that it should be easy: What's the big deal?" When the Harmons demonstrated their switch, it raised the gate when the train had cleared it by 2 feet.

As word of the Harmons' innovation spread, the orders poured in. At last, Harmon Electronics had a product with a long life. But as sales jumped into the millions, Bob Harmon found himself increasingly uncomfortable. "I was primarily an engineer, not a manager," he says. "I didn't really have any major wish to operate a larger company."

In 1969, Bob Harmon retired from active management of the company. "He literally cleaned out his desk and left," Gene says, and went on an extended trip to Europe. Bob Harmon remained the majority stockholder, but only until 1972, when Gene took the company public.

Throughout the '70s and into the early '80s, Harmon Electronics built its sales on electronic controls for grade crossings, like those that first brought



PHOTO: © CHUCK WEYSE—BLACK STAR

*In Harmon Electronics' main plant at Grain Valley, Mo., the Harmons inspect circuit boards of the kind that the company uses in sophisticated products that control both trains and crossing signals.*

ders for the first two years' production.

Harmon Industries did not invent the Cedrite process, but in other respects, the Cedrite plant typifies the Harmon approach to business. Repeatedly, Harmon Industries has embraced novel technologies and absorbed short-term costs for the sake of long-term gains; the company typically spends 5 or 6 percent of its revenues on research and development. It has, as a result, survived and prospered in a complex, rapidly changing industry.

Dramatic changes have occurred in just the 10 years since Congress relaxed the federal government's regulatory hold. Trains run today with much smaller crews than in the past, relying instead on sophisticated electronics of the kind that form the backbone of Harmon Industries' business.

Harmon Electronics, Harmon Industries' predecessor, was born in a very different world. Gene Harmon's father,

two-way radios to the railroads; when the company faltered, Harmon went into business for himself.

It was slow going at first, says Bob Harmon, who just turned 77: "The railroads were very conservative in dealing with new companies." But, Gene Harmon says, his father found his niche by accepting "the tough projects that nobody in their right mind would take on."

Bob Harmon's forte, Gene says, was finding some way "to transmit data from point A to point B by stealing a ride over some other circuit." For example, railroads rely heavily on hotbox detectors—trackside devices that use beams of infrared light to locate defective axle bearings (overheated bearings are called hotboxes); they can freeze a wheel in place and eventually derail the train. Bob Harmon found ways to transmit such information over power lines or telephone lines, without inter-

it success in 1964. Even now, such products account for perhaps \$20 million of Harmon Industries' annual sales, which hit almost \$65 million in 1988. But, Gene Harmon says, he recognized years ago that there would be a ceiling on how much the company could grow with a limited product line—especially considering how fiercely competitive its industry was, and how effectively the railroads resisted price increases. Harmon Electronics was consistently profitable, but not at levels that encouraged complacency.

In 1984, Gene Harmon started acquiring companies that complemented Harmon Electronics. (Harmon Industries was set up as a holding company in 1986, with Harmon Electronics as one of its subsidiaries.)

One acquired company makes the hardware—crossing gates and flashing lights and so on—to go with Harmon Electronics' electronic controls; another makes electronic equipment that's used to control the flow of railroad traffic. In the span of a few years, Harmon Industries has become the railroad equivalent of a men's accessory shop, selling just about everything except the trousers and coats—that is, the trains and the tracks.

And even that may change. In 1987, Harmon set up a subsidiary that holds inventories of railroad equipment; it can quickly assemble such equipment into complete kits, so that, for example, a railroad that needs a signal installed can get everything at once from Harmon. The warehouse subsidiary is, Gene Harmon hopes, one way that Harmon Industries will get a leg up on the future, as the railroads lean more and more toward contracting out.

It is, however, at the current main plant of Harmon Electronics that the future seems to have already arrived. Take hotbox detectors: When a detector spots a hotbox, no longer is it necessary to transmit a warning to a central point. Now the detector speaks directly to the engineer, in radio messages provided by a voice synthesizer; a detector can tell an engineer not only that his train has a hotbox but also exactly where it is.

Just as remarkable, perhaps, is the "speed limiter." It was developed following a 1987 accident that killed 16

people at Chase, Md. A Conrail train of three locomotives went through a stop signal, intruded onto a high-speed track, and was struck by an Amtrak passenger train traveling over 100 mph. The Federal Railroad Administration mandated that railroads in the Northeast Corridor adopt equipment that would slow a freight train automatically if the engineer failed to heed warning signals. The task was complicated by the need to avoid stopping trains abruptly. Gene Harmon explains:

"On a passenger train, you can put the brakes on in an emergency, and about all you're going to do is throw the passengers around a little bit; you're not going to derail the train. With a freight train, you have a high probability of derauling the train by locking the brakes," because loaded cars may alternate with empty cars, and "the heavy car behind a light car tends to want to push it off the track." If a freight train should derail while it's passing a passenger train, so much the worse.

Harmon's speed limiter was chosen over a competitor's, and now, Gene Harmon says, it is being installed on locomotives all over the U.S. "Our equipment looks down the track and says, 'Okay, in 40 seconds from now you need to be at 30 miles an hour.' If the engineer doesn't start braking in a sufficient time, we start applying the normal brakes for him." The system automatically—and gradually—takes the train to a complete stop if the engineer fails to act.

It's easy to imagine such technology being extended to other kinds of traffic; think how much safer highways would be, for instance, if cars could respond automatically to hazards.

Gene Harmon isn't particularly interested in such applications now, but with the railroads, and transportation of all kinds, evolving rapidly, perhaps in a few years Harmon Industries will be contemplating invitations to compete in the design of altogether new safety systems.

"We love challenges," Gene Harmon says. "We jump on those things. When somebody says, 'Okay, you design this product and we're going to compare it to this guy's product,' that's all we need." **■**

*"It's not very often that you get a chance to solve a major environmental problem and make some money doing it. ... The question is whether we can build ties at a pace fast enough to recoup the capital cost of the plant."*

# AVOID BUILDING MISTAKES

Plan your next business facility with confidence.



VP Buildings offers this valuable guide to construction, including a special planning worksheet, free to building decision makers. To maximize your project's potential and to avoid costly mistakes in facility planning and construction, write or call for yours today!  
**1-800-238-3246.**



Built On Superior Service

FREE! "Building Methods Compared" including the planning worksheet  
Mail to: Varco-Pruden Response Center  
P. O. Box 3900  
Peoria, IL 61614

COMPANY: \_\_\_\_\_

YOUR NAME: \_\_\_\_\_

TITLE: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY: \_\_\_\_\_

STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_

PHONE: (\_\_\_\_\_) \_\_\_\_\_

(1) NB-1/90