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CONSTRUCTION EXCELLENCE

A publication from
Nooter Construction Company
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Volume 2 • Issue 4

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TEAMWORK IN MOTION

**Nooter Construction
successfully completes
major refinery project**

CLEAN AIR Refineries invest in the future

CONSTRUCTION EXCELLENCE

is a publication from
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CONSTRUCTION

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Opening Remarks

Nooter Construction Company (NCC) used the occasion of the 31st Consolidated Convention of the International Brotherhood of Boilermakers to officially turn over the rights to a mural depicting its employees at work to the Boilermaker Archives.

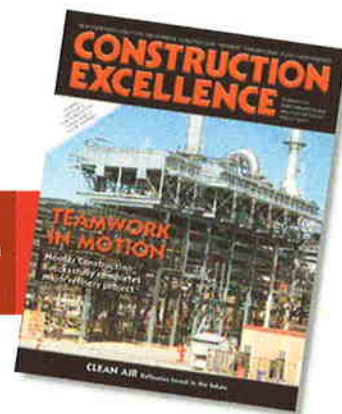
The mural, painted by Siegfried Reinhardt in 1958, had been displayed in the lobby of NCC's St. Louis headquarters for nearly half a century. NCC decided to donate the 7-foot x 16-foot mural when the company moved its headquarters.

Making the presentation for NCC were Jimmy Nelson, President, and Dave Zach, Vice President and General Manager of the St. Louis office.

Nelson told the delegates that the mural "emulates the strength, determination, and quality of the Boilermaker, not content with merely good work, but always with the finest."

International President Newton B. Jones called NCC "an outstanding employer of Boilermakers and a great friend."

The mural was used as the graphic basis for the convention website, convention materials, and the cover of *Grace Under Pressure*, a history of the Boilermakers published by the Boilermaker Archives and distributed to convention delegates. The "Nooter mural" will be displayed at the Brotherhood's new headquarters in Olathe, Kansas.



About the Cover:

Nooter Construction completes major capital project work with excellent safety and quality.

In This Issue

More Value, Less Cost Single-source contractors mean worry-free projects	4
The Right One for the Job Knowledge and experience are a must in field-applied coatings	5
The Difference is in the Details Seasoned professionals tackle the complicated bidding process	6
Clean Air Refineries invest in the future	8
Room to Grow New office allows Delta Nooter to establish Philadelphia presence	9
Teamwork in Motion Nooter Construction successfully completes major refinery project	10
Risky Business Tool safety is one key to injury reduction	13



More Value, Less Cost

Industries We Service

RMF Nooter provides construction expertise, outage and repair services, maintenance, and project management. With a focus on our core disciplines of boilermakers, pipefitters, electricians, and millwrights, along with various support crafts, we service the following industries:

- Refineries — Outages, New Construction, Retrofit, and Repair
- Utilities — Outages, New Construction, Retrofit, and Repair
- Heavy Industries — Electrical and Power Installations
- Industrial — Food and Beverage Operations, Installation, and Service
- Manufacturing Equipment Erection and Installation
- Solids Handling Equipment Installation and Service
- Metals Manufacturing and Processing Systems Installation and Service

Single-source contractors mean worry-free projects

By Tom McDonough

The Rolling Stones were wrong. You can get satisfaction, especially if you are a plant manager, corporate procurement director, or project manager with a complex, heavy industrial construction job. All you need is a multitasking, multicraft contractor to supply all the trades and services necessary to solve any challenge a job presents.

"There is an old cliché about one-stop shopping," says Mike Pollauf, General Manager for RMF Nooter, a Toledo, Ohio-based contractor that is part of the Nooter family of companies. "If you can hire one contractor with all the crafts needed for a job, things just seem to go so much better for the end user."

One-Stop Shop

RMF Nooter has specialized in providing multicraft approaches to construction projects for the past 20 years. The company has completed projects for refining, electrical power, manufacturing, food, and other industries. "All of our expertise translates into project efficiencies and customer savings," says Gary Roberts, RMF Nooter's Manager of Business Development.

The benefits in hiring a single-source contractor are numerous. "First, clients only deal with one project manager and one contact for all trades," he explains. "That reduces job stress."

The result is better communication and coordination between trades. "You can have in-house job meetings with all the general foremen to address issues before they become major problems," Roberts says. "Contractor complaints about 'delays by others' are eliminated."

Safety and quality assurance/quality control (QA/QC) receive a boost because there is a uniform set of safety and quality guidelines at the jobsite.

But the real benefit for a customer in hiring a single-source contractor is saving money. "Costs are reduced because less time is spent coordinating workflow and responsibilities," Roberts says. "Hiring a single-source contractor creates opportunities for the crafts to share leased equipment, like cranes and manlifts. Customers also don't have to pay for multiple QA/QC and safety inspectors."

A Case in Point

To illustrate how a single-source contractor can make projects more efficient and less costly, Roberts points to a recent electrostatic precipitator rebuild RMF Nooter did for the Detroit Edison Company (DTE) in Monroe, Michigan.


"This utility's work scope involved replacing 20 transformer sets and 48 switched integrated rectifier (SIR) units to make the precipitator more efficient, as well as doubling the number of wire plate rapper assemblies," Roberts says. "The job also specified the wholesale change-out of the system control cabinets, power control, and cable tray conduits."

"If you can hire one contractor with all the crafts needed for a job, things just seem to go so much better for the end user."

— Mike Pollauf,
General Manager for RMF Nooter

If that were not enough, the project was "fast-tracked," reducing the time to complete it from the original 45 days to 25 days. "We took a proactive approach to this, attending DTE's design scope meetings, participating in problem-solving sessions, and providing material procurement alternates," says Roberts.

Early in the demolition phase, RMF Nooter encountered a potential schedule-busting problem. Upon inspection, the structural integrity of the upper precipitator roof became suspect. Engineering analysis confirmed that it had to be replaced.

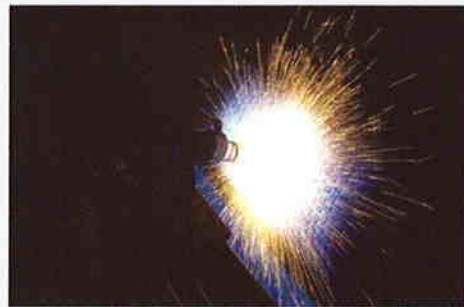
"To complete this rebuild successfully and on time, our multicraft team worked 24/7 for the entire 25 days it took to finish the job," Roberts says. "More important, since safety is our number-one priority on any project, this one, despite its hectic pace, was completed safely. Had this rebuild used several different contractors for the different crafts, I doubt very much that the outcome would have been the same. Less stress, better safety and quality controls, and cost savings," he continues. "Many heavy industrial construction jobs just have a better chance of being hassle-free if a company hires one contractor who can supply all the trades and equipment needed." 

The Right One for the Job

Knowledge and experience are a must in field-applied coatings

By Dave Morningstar

Anyone can buy the appropriate tools for the task, but the end result depends on the skill and training of the person using those tools. Putting tools, even the right tools, in the wrong hands is a recipe for disaster. A prime example of this principle is often seen in the inconsistent results many end users have experienced with field-applied protective coatings.



The materials to be deposited as the coating are fed into the spray gun in powder or wire form where they are atomized before being accelerated towards the substrate.

Most of these coatings are applied with the "twin-wire" process, which utilizes an electric arc between two wires to create molten particles of the coating material and a blast of compressed air to propel them onto the base material. Virtually anyone can purchase the necessary equipment and claim to be a professional "twin-wire" applicator, but there is more involved in a successful outcome than simply pointing the spray gun and pulling the trigger.


Knowledge Needed

"Unfortunately, the field-applied protective coating industry does not yet have an equivalent to the organizations that train welders, and inspect and certify their work," says Dan Marino of ArcMelt, Inc. That means customers have to be very careful to select an applicator with the technical background and experience necessary to produce a satisfactory outcome.

Nooter Construction Company (NCC) makes exclusive use of ArcMelt materials and technology for field-applied protective coatings because they have demonstrated superior performance. ArcMelt also provides the necessary technical support. Once the materials are selected and tested, NCC then applies

the same rigorous planning and certification process to the application that is used on all phases of its construction projects.

Planning Is Everything

"Nooter Construction Thermal Spray installers will follow written application procedures that the customer can examine and compare to the test conditions," Marino explains. "They also will be able to provide the customer analyses of the test coating to ensure a satisfactory result for the customer. There are also extensive safety procedures," Marino notes, "to protect the customer personnel and equipment, and the Nooter people applying the coatings. It's all thought out beforehand and for everyone to evaluate before the job starts." 

Thermal Spray Coatings

Spray coatings may be applied either manually or by machine, depending on complexity, cost, and certain environmental and safety concerns.

Some common reasons for spray coating are:

- corrosion protection
- fouling protection
- to increase conductivity
- to increase surface hardness
- to repair damaged surfaces
- high temperature protection (thermal barrier coatings)

Some common types of thermal spray are:

- Flame Spraying
- High Velocity Oxygen-Fuel (HVOF)
- Detonation gun (D-Gun)
- Plasma Spraying
- DC-arc plasma spray
- RF induction plasma spray
- Wire-arc spray
- Plasma transferred arc spray

For more information, email sales@Nooter.com

The Difference is in the Details

Seasoned professionals tackle the complicated bidding process

By Mali R. Schantz-Feld



Back in simpler days, a handshake was all it took to get a project rolling. The modern construction arena, however, mandates a detailed process of bidding and risk assessment. Chris Cimarolli, General Manager of Contracts for Nooter Construction Company (NCC,) explains that it is now one of the most complex parts of a construction project.

The Bidding Process

Bids arrive at the contracting group in three forms, according to Cimarolli — lump sum, cost reimbursable with a fixed fee, and time and materials (T&M). When the owner calls for a bid meeting, the meeting is attended by the NCC general manager of contracts, as well as the contract engineer and the project manager.

"A lump-sum bid requires tremendous effort that takes about four to six weeks, with a team of skilled and knowledgeable people," says Cimarolli. The team assesses and estimates man-hours and equipment needs and communicates with subcontractors regarding pricing before returning to the owner with the bid. The cost-reimbursable with a fixed fee method permits fine-tuning after the project has been awarded, allowing for a final estimate at least six weeks prior to the start of the job. With both of these bid types, experienced employees with at

least 10 to 20 years of experience in construction are entrusted with these decisions.

"Every owner has a different preference," says Cimarolli. In a lump-sum situation, the construction company assumes all of the risk. "However, if the scope changes, materials are delivered late, or




Chris Cimarolli – General Manager of Contracts for Nooter Construction Company

something else happens that is out of our control, typically a field change order is required to reflect the impact of the changes on our contract." The cost-reimbursable fixed fee contract structure is much more flexible with regard to scope changes or material delivery impacts. Although the owner

assumes some of the risk, financial incentives or bonuses can be built in to the contract for meeting deadlines or other project-specific targets.

Beyond the Bid

Companies that choose NCC realize that the bid not only covers the materials and workers, but also the prowess of the contractor's staff. "We have a lot of depth," says Cimarolli, recounting the company's experienced personnel in quality assurance/quality control, safety, welding, engineering, and rigging. "If the project gets into a bind, our staff can help them," he notes. "If they just choose the lowest bidder, and he gets in trouble, he just throws up his arms because he doesn't have the right people."

With the changing construction industry, the cost-reimbursement method is gaining in popularity. "Manpower is tight," says Cimarolli. "There is more work and fewer people around to do it." Regardless of the bidding process taking place, "safety and quality are taken into consideration under all of our budgets." 



Refineries invest in the future

By Tom McDonough

Electrostatic precipitators (ESPs), or electrostatic air cleaners — those efficient, reliable pollution-control devices that first came into existence in the early 1900s — have performed admirably over the years, cleaning exhaust streams for a host of manufacturing industries, such as paper and cement mills, electrical power companies, and petrochemical plants.

However, most are now decades old and equipped with technology that is no longer state of the art. The manufacturing companies that use them also have to contend with new Clean Air Act amendments passed over the last two decades that mandate more stringent requirements on what factories and plants can emit into the atmosphere. Those regulations have put increasing pressure on ESP owners to make sure

their units operate at maximum levels. They have also created a real dilemma — should companies replace their aging units completely or can they be rebuilt to make them more efficient, cost effective, and technologically sound?

Electrically Charged

ESPs work by electrically charging particles in exhaust streams, causing them to adhere to metal plates inside the precipitator. If particles are collected dry, the metal plates are tapped or rapped to loosen the materials, causing them to fall into hoppers for collection and disposal. Wet precipitators rely on gravity to collect particles.

According to Mike McCormack, Construction Manager for RMF Nooter, a Toledo, Ohio-based contractor that is part of the Nooter family of companies, the various components of an ESP — discharge electrodes, collecting plates, rappers, transformers, ducts, and electrical controls — all can be replaced, usually at a substantial savings over installing a new one.

"It's estimated that an ESP can be rebuilt for about 75 percent of what it costs to install a new unit," he says. "And with rebuilding, it can be done over time, giving the owner more flexibility than having to gut an old unit and put a new one in."

ESP rebuilds can be simple, with just the plates and wires replaced, or total upgrades with the latest design improvements. Recently developed rigid electrodes, collecting plates that respond better to



An electrostatic precipitator (ESP) is a particulate collection device that removes particles from a flowing gas using the force of an induced electrostatic charge.

rapping forces, new high-voltage transformers, and microprocessor-based controls can improve a unit's efficiency and reduce its energy requirements. ESPs also can be widened, lengthened, or made taller to accommodate more discharge and collecting electrodes, increasing the collecting area and treatment time, thereby adding capacity and further reducing emissions.

First Things First

McCormack says that each and every ESP rebuild is different, presenting its own challenges, but RMF Nooter's approach, honed over the past 20 years, is always the same. "First, we look at the constructability of the project," he says. "We come in and work with the owner to determine what can be done in the timeframe it has to be done."

Nooter offers rebuild customers a fixed-fee cost-reimbursable contract, which has fixed costs for equipment, consumables, and supervision, but bills for the actual trade labor required on a job. "It is really a win/win for us and the customer," says McCormack. "Say we figure the job will need 90,000 man-hours, but it only requires 75,000 man-hours. The customer will only be billed for that amount. It's a better contract than a lump-sum or time-and-materials contract."

The actual work on an ESP is done modularly. "We rebuild precipitators by taking one section out at a time. Modularization allows us to work from atop

the ESP, under the hot roof, avoiding the congested areas and unsafe conditions," says McCormack.

A capability RMF Nooter possesses that makes ESP rebuilds cost effective is its custom fabrication shop, where replacement sections can be made and pre-welded, so they can be reshipped to the jobsite and slipped back into the unit, saving more time and money.

Assessing the Situation

For ESP owners deciding to rebuild a precipitator, McCormack recommends a thorough inspection of




Nooter Construction Company recently completed electrostatic precipitator upgrades at Detroit Edison's Monroe Power Plant – one of the largest coal-burning power plants in the nation.

the unit to determine the structural condition of the casing and how the ESP is meeting emission and performance standards. If the following problems occur, it is probably time to rebuild:

- Plate deterioration
- Plate corrosion
- Wire breakage
- Misaligned wires due to particle buildup
- Frequent outages

If a plant, especially an electrical plant, has changed its fuel source or has modified its processes, an examination should take place to determine how the changes affect the ESP's performance and operation.

"A rebuilt ESP may be all that is needed to help a plant or mill run at optimum capacity," McCormack says. "However, planning and timing of these projects are essential, because so many things have to be done. What we like is to be brought in early in the process to work with customers to determine how we can do things more safely and meet their schedule, which often is crucial." 

Room to Grow


New office allows Delta Nooter to establish Philadelphia presence

By Bavand Karimzadeh

Nooter Construction Company (NCC) opened its first office in the Philadelphia area in 1980, occupying approximately 800 square feet. With the substantial amount of regional growth in Pennsylvania, Delaware, and New Jersey, the office had grown to its present size of 18,200 square feet, but it was not enough.

"While we weren't completely out of space, we knew we had no room for growth in staff personnel and services," says Peter Cimino, Vice President and General Manager of the Philadelphia Regional Office. "Our new location was carefully planned to meet our current and future needs, while keeping the cost per square foot the same." The new NCC office, located at Six Neshaminy Interplex in Trevose, occupies the entire third floor of a recently modernized six-story building on a large business campus, only two miles from the former office in Bensalem.

The new space allowed Delta Nooter Exchanger Services to establish a local presence in the Philadelphia area. "Exchanger equipment and staffing is now in place to better support the Philadelphia area," states Jerry Leslie, General Manager of Delta Nooter. "We have a long history of working in the Philadelphia area and appreciate the opportunity to work from the new Nooter Construction office."

"The former offices did not offer any room for us to add many of the necessary components to keep our business practices on the cutting edge," says Edie Hayes, Office Manager for the Philadelphia-area location. "Many of the additions we have made will allow us to perform more efficiently and communicate better with employees, which will, in turn, help our customers." 



NCC Philadelphia office

Wet Electrostatic Precipitator

Electrostatic precipitation is typically a dry process, but spraying moisture into the incoming air flow helps collect the exceptionally fine particulates and reduces the electrical resistance of the incoming dry material to make the process more effective.

A WESP (wet electrostatic precipitator) merges the operational methods of a wet scrubber with an electrostatic precipitator to make a self-washing, self-cleaning yet still high-voltage device.

Teamwork in Motion

Nooter Construction successfully completes major refinery project

By Mali R. Schantz-Feld

Valero's Delaware City Refinery, located on 5,000 acres along the Delaware River, processes 180,000 barrels per day (BPD) of low-cost heavy sour and high acid crude oil, with a total output capacity of 210,000 BPD. The refinery's production includes conventional and reformulated gasoline, diesel, low-sulfur diesel, and home heating oil, as well as ultra-low-sulfur diesel. The major refinery units include a 180,000 BPD crude unit; an 82,000 BPD fluid catalytic cracking unit; a 47,000 BPD fluid coker; and a 43,000 BPD catalytic reformer.

The petroleum coke production is sold to third parties or gasified to fuel a cogeneration facility, which supplies electricity and steam to the refinery. Acquired in 2005, the facility contributes to Valero's strategy of converging heavy, sour feedstocks into cleaner-burning fuels. Nooter Construction Company's (NCC) team has been working on large and small capital projects at Delaware City, utilizing construction, management, and safety experience to help Valero install new equipment at the refinery.

Project Parameters

One large capital project entails "a sulfur-reduction program to install scrubbers to clean the air," explains Jim Haney, NCC's Vice President of Refinery Services, who notes that the project was spurred by the federal government's mandated sulfur reduction in all refinery processes. First, the NCC team replaced the scrubber for the coker plant and then moved to the scrubber and ductwork for the fluid catalytic cracking unit.

NCC won the project on a lump-sum bid to Jacobs Engineering, the refinery's construction manager. Haney notes that the lowest bidder does not always win the project. "It depends on what they bring to the table — the ability to manage subcontractors and teams, safety record, costs, and quality control." He adds that NCC "has excellent safety and quality control performance, and an excellent



Nooter Construction project team erects new scrubber.


rigging department for heavy lift expertise. We're the finest in the country."

At its peak, the project necessitated a 500-person workforce and varying levels of management, including an overall project manager, construction manager, materials manager, and cost manager. Communication is key to success, states Haney.

"For consistency, we use the NCC management system, a set of 34 key processes for all aspects of work," says Haney. For safety, "Our Positive Awareness Coaching and Teamwork (PACT) program has won national awards." Implementing necessary changes is the most challenging part of a project of this size. Changes must be identified, written up, and submitted for approval before implementation.

Also Under Way

The Nooter small capital project team completed 80,000 man-hours of work at the refinery including a turnaround of the sulfur recovery unit (SRU). The six-week SRU work was completed on time, according to Vice President of Power Jim Woodward, who oversaw the small capital group. "We are very proud of our work at the refinery. Nooter has been in the business for over 100 years and built a reputation in the industry, and I intend to uphold that reputation," he says.

For any construction project, compressed schedules and deliverables pose the greatest challenge throughout the industry. "The whole industry struggles to get the materials delivered in a timely manner," says Haney. However, the trust factor gives the client peace of mind that the project will finish successfully. "Together with our customer, we work as a team to get the job done." 



Project work completed by Nooter Construction

Risky Business

Tool safety is one key to injury reduction

By Mali R. Schantz-Feld

The Power Tools Institute (PTI) cites the three main factors related to power tool injuries: inattention through repetition, an unexpected event, or inexperience and overconfidence. A power tool operator can lose focus on a bustling construction site, filled with looming deadlines and repetitive tasks. In this situation, complacency is the enemy. PTI suggests that operators pause after a few repeat operations and refocus on the task with renewed awareness.

Accidents Await

"One focus is on grinder safety," says Robert Miller, Regional Safety Manager in Nooter Construction Company's (NCC) St. Louis office. He describes one dangerous scenario — a worker holding a piece of material in one hand and the grinder with the other. "He may be concentrating on getting a certain length bevel but not on the hazard of his body position or what may happen if the grinder flips out of his hand," he suggests. On NCC work sites, any material must be secured to a vise or another piece of equipment with a clamp.

Since power tools operate at very high speeds, deviations occur quickly, resulting in unexpected events. A kickback can hurl a heavy tool directly at the operator. A sudden distraction can cause the operator to lose focus on his hand position in relation to a sharp blade.

Proactive Prevention

NCC's safety personnel proactively address potential hazards. Site safety representatives stay onsite at each

"We have the flagship safety program in this industry."

— Robert Miller, Regional Safety Manager

job. "Through toolbox meetings, we have increased our own awareness of grinder safety," says Miller. "We have outlined some guidelines on the grinders and sent some recommendations to the manufacturer to improve the grinder's make-up. So far, the side handles

have been adjusted, allowing for better ergonomics as well as better control."

For eye protection, ANSI Z-87 safety glasses are mandatory. If particles fly in the area due to the usage of pneumatic tools or a dusty atmosphere, workers are also required to wear face shields. Sturdy leather work boots with protective toes or metatarsal guards may also be required. "The metatarsal guard is best if there is potential for a jackhammer to strike you in the foot," says Miller.

Requirements at refinery or chemical plants include fire retardant clothing such as Nomex® or Indura® Proban for flash fire resistance. "On a daily basis our employees are instructed to inspect all tools, full protection gear, rigging tools, equipment, materials, and personal protective equipment (PPE)," says Miller.

Stellar Results

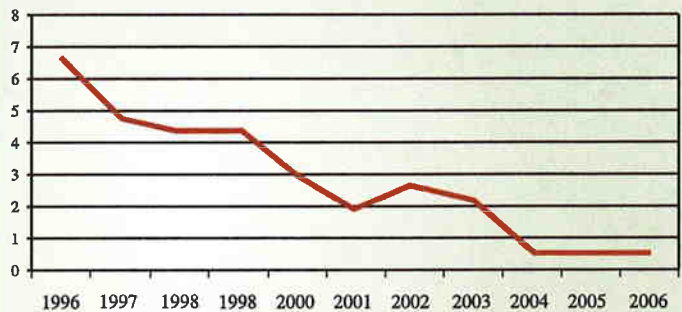
Distribution of guidelines, safety representatives on each jobsite, and inspections and audits have increased awareness significantly. Weekly or daily



Since power tools operate at very high speeds, deviations occur quickly, resulting in unexpected events.

Nooter Construction Company Safety Performance

OSHA RECORDABLE INCIDENCE



Over the last 10 years, the NCC incident rate has decreased to an OSHA recordable rate of less than 1.0.

Positive Awareness Coaching Teamwork (PACT)

PACT works on the premise that safety is integral to a company's operations. Its procedures become part of the daily routine through employee safety training seminars, evaluation sessions, and skills building workshops. There is no time limit on implementing PACT because changing attitudes and habits isn't a quick or easy process. It took Nooter more than six years to develop and implement the program to the point that safety became every employee's second nature.

toolbox meetings (depending on the job) inform workers of safety updates and site incidents. Pre-job plans discussed each morning outline the day's work, potential for hazards, control measures, and necessary equipment and tools.

Over the last 10 years, the incident rate has decreased from more than 6.0 to 0.49, a "12-fold difference," touts Miller. "Nooter has worked over four years and 6 million man-hours without a lost time injury. We have the flagship safety program in this industry," Miller says, one which continuously improves through feedback and suggestions from supervisors and workers as well as safety personnel. "We don't use our safety representatives as police," he notes. "We count on a buy-in from the employees for enforcement of safety procedures. They have input on safety procedures, so they take them to heart." 