

“ We give every worker the tools to make smart safety decisions. ”

## How to Prepare for Emergencies

A heartbeat is long enough to turn an ordinary day into an emergency. If workers are not already prepared to respond, it's easy to make mistakes.

Gary Tellish, National Vacuum Corp.'s corporate health and safety manager, spent 10 years as a consultant training people to respond effectively in emergencies.

Tellish wants to make worksites safer, but he also sees sound business benefits from safety planning. By reducing accidents, companies can cut insurance costs, lessen the likelihood of problems with OSHA, and minimize the chance of lawsuits. Here are some of his suggestions:

**Develop and enforce policies.** OSHA rules do not cover vacuum trucks or water blasting, but the Occupational Safety and Health Act of 1970,

Section 5(a)(1) says companies must protect workers from recognized workplace hazards. You can do that by formalizing safety rules, such as the training needed to run equipment and jobsite work practices.

To meet OSHA expectations, companies must enforce policies. “We have a three strike rule for most violators,” says Tellish. “We send a letter and next time we suspend them a couple of days. If there's a third time, they're terminated. Some rules are so important, we'll let them go right away if they violate them.”

**Foolproof equipment.** Early in his career, Tellish watched a vacuum truck suck in a man's arm. Today, he assumes machines will bite you if they can. His solution is to try to foolproof them.

The essential piece of vacuum truck safety equipment is the safety-T. The fitting splices onto a hose and has a beveled opening covered by a metal plate. The vacuum keeps the plate closed. If the hose sticks or pulls on a person, the operator pulls a lanyard attached to the plate and breaks the vacuum.

To minimize waterjet dangers, Tellish uses 48-inch-long welded lances. Long lances keep jets far away from the body. Tellish also discards barrels that have been cut and repaired, since repairs could fail.



**Train workers.** Tellish teaches Red Cross-certified first aid and CPR basics. His crews also take OSHA's general industry and construction safety courses, and some learn confined space rescue. They also take OSHA's Hazardous Waste and Emergency

Response (HAZWOPER) training, so they can work safely at chemical plants and respond safely to spills and transportation accidents.

**Train customers.** “We go over a safety checklist and have our customers sign it so they understand the hazards,” says Tellish. This makes it easier for crews to enforce safety, especially during turnarounds when other contractors are racing against the clock.

**Create a worksite safety plan.** Before every job, Tellish's crew managers and customers go over a checklist of potential worksite hazards. They start with thermal, chemical, respiratory, and mechanical, as well as such confined spaces, trip and fall potential, and electrical dangers.

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# Less is More: Understanding Waterjet Pressure Drop

**C**all Jetstream to buy a tube cleaning nozzle and we question you about the job, pump flow and pressure, and hose and lance sizes. You may wonder if we want to know your shoe size too. Why all the questions?

It's because we use the information to help you deliver maximum cleaning power to the workpiece by managing pressure drop. Pressure drop is the difference between the water pressure exiting the pump and entering the nozzle. It determines the velocity of water at the workpiece, and is very important when using small-diameter lances.

## Straws and Stirrers

To understand why pressure drop is an issue in small-diameter tubes, imagine sipping water through a straw and a hollow plastic stirring stick used to mix coffee. The more suction you put on the straw, the faster the water flows through it.

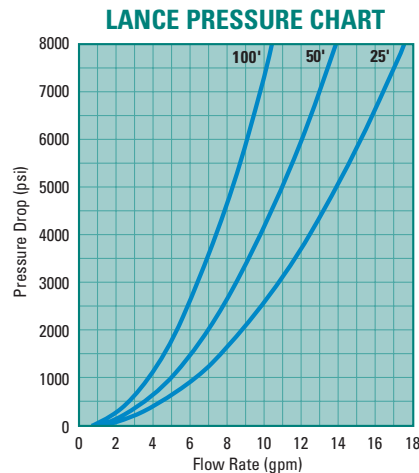
Try that with the stirrer and you'll find it takes much more suction to achieve the same amount of flow. Because the water moving through the thinner stirrer generates much more friction, your lungs cannot produce enough suction to provide a flow equal to a very low, comfortable suction across the straw.

Pressure drops in small-diameter waterblast lances and nozzles work the same way. By finding the best match of water pressure, flow, and nozzle size, you can actually get more work done than by cranking up pump pressure and flow.

## Theory and Practice

There are several ways to minimize pressure drop:

- Pick the largest diameter lance that will fit inside the tube you're cleaning. The larger the inside diameter (ID), the lower the pressure drop for a given flow.
- Use the shortest lance possible. Pressure drop occurs along each inch of length: a 50 ft lance produces twice as much as a 25 ft lance for any given flow.
- Pressure drop through hoses, fittings, and valves is usually minor, but if it becomes an issue, increase hose diameters and shorten lengths.
- Pick the right nozzles. Some jobs may require separate nozzles to unplug tubes, clean walls, or flush out sediment.



## Graphs and Charts

Finally, pick a nozzle with the right flow rating to maximize cleaning force. When you call to order a nozzle, Jetstream sales reps find the right nozzle by using graphs and tables published in our 40K, 20K, and forthcoming 15K catalogs. Here's how we do it:

Suppose it takes 6,000 psi to clean a tube's deposits. Your 174 hp unit is set up for 10,000 psi and 27 gpm. Assuming a minimal pressure drop from the pump through the foot valve, you can allow a 4,000 psi pressure drop through the flex lance and still get 6,000 psi at the nozzle. After determining that the largest nozzle that fits in the tube attaches to a 5 mm (ID) lance and that you need a 50 ft length, it's time to go to the charts.

The 5 mm Lance Pressure Drop graph contains lines for three different lance lengths. The values on the left represent pressure drop. Read across from 4,000 psi until it crosses the 50 ft line. Then drop down to read the flow that will produce this pressure drop. In this case, 10 gpm flow yields a 4,000 psi pressure drop.

Now go to the 5-mm Nozzle Flow Rating chart. Find the column with the amount of pressure you need to deliver 6,000 psi. Drop down the column to the closest flow rate less than or equal to 10 gpm (from the previous graph). It is 9.7 gpm, which gives you a nozzle flow rating of 12.

Pumping 9.7 gpm along a 50-foot lance with a No. 12 nozzle delivers 6,000 psi to the workpiece — twice as much pressure than you would have received from trying to force the entire system horsepower through the lance. By understanding pressure drop, you work smarter, faster, and more profitably.

# NEWS & EVENTS

*Interested in Learning more about Guzzler, Jetstream and Vector products?*

*Stop by and see us at these upcoming events!*

## Underground Construction Technology (UCT)

January 24-26, 2006  
Cobb Galleria Center  
Atlanta, GA  
Go to [www.uctonline.com](http://www.uctonline.com) for more information.

## Painting & Coatings Expo (formerly SSPC)

Jan. 29 - Feb. 1, 2006  
Tampa Convention Center  
Tampa, FL  
Go to [www.pace2006.com](http://www.pace2006.com) for more information.

## Pumper & Cleaner Expo

February 16-18, 2006  
Opryland Hotel Convention Center  
Nashville, TN  
Go to [www.pumpershow.com](http://www.pumpershow.com) for more information.

## NOZZLE FLOW RATING

FLOW RATING NUMBER	2000 PSI	4000 PSI	6000 PSI
9	5.72	8.09	9.91
10	6.53	9.24	11.31
12	7.04	9.96	12.20

# Rentals: For Emergencies Big and Small

Even before Hurricane Katrina made land-fall in New Orleans, the phones began ringing at vacuum truck rental services. Contractors were calling to line up equipment.

As the emergency evolved, renters worked overtime to manage changing requirements. They pulled trucks from other regions and tried to find contractors willing to let go of leased equipment for emergency work.

For Environmental Rental Services (ERS) general manager Jerry Long, the bottom line was simple: "If the public is depending on you to perform, you don't want to be the missing cog on the gear. You have to come through."

## Growing Businesses

Vacuum contractors rely on rentals for both major and minor emergencies. "About half our calls come at 7 in the morning, when someone needs to pick up a truck right now because a unit broke down or they need extra equipment to meet a deadline," says Long.

Rentals can also help contractors grow their businesses by providing specialized equipment or more trucks for large projects such as plant turnarounds. Some companies lease equipment with an option to buy in order to try out a new market or line of business.

"We've provided long-term rentals when companies didn't have capital budgets, and we've helped new people get started in the business," says Dan Weber, president of Jack

Doheny Rentals. "Some people rent trucks from us until the factory can get them the one they want."

## Making Rentals Work

Contractors can do several things to make rental experiences move more smoothly.

**Get ready.** Contractors need to have qualified drivers, viable insurance, and have a good process to document miles and gas receipts, says Weber. "Most guys can provide liability and damage coverage through their existing insurance policy without additional charges," he explains. "They also need a good IFTA reporting process, since we have to report the information to the government."

**Form relationships.** Strangers don't walk into a bank and get loans the same day. The same is true of rental agencies. "The first thing you should do is get an account set up," says Phil Maichle of Vacuum Truck Rentals. "That starts a relationship. It gives us a chance to learn about your needs, your equipment, and your training. Then if you call, we're ready to help."

**Give a heads up.** Call early if you're planning a major project. "That gives us time to plan so if we have equipment nearby we can get it to you without transfer costs," says Long. "It also gives us more time to make sure you have any special equipment you need," adds Maichle.

**Reach out for help.** Rental agencies deliver and most provide qualified drivers with enough training to operate a vacuum truck safely. "Our customers usually know what they're getting into, but sometimes situations get tricky," says Maichle. "We can help them with everything from picking the right truck to job setup and dealing with difficult materials."

Rental agencies make their living by supporting their customers where and when they need it. "We're not real crazy about moving a truck from Carolina to Houston on a four-day job," Long concludes. "On other hand, if you've rented from us in the past, we'll suck it up to make sure you look good."

"If you continue to grow, our business will continue to grow."

## EQUIPMENT RESOURCES

**Doheny Supplies**  
Dan Weber  
248-939-3227

**ERS**  
Jerry Long  
1-888-VacRent

**JT Rentals**  
Jerald Templeton  
281-867-9700

**Nighthawk**  
John Crader  
337-912-1552

**UVAC Rentals**  
Jack Cibulski  
713-473-5588

**Vacuum Truck Rentals**  
Phil Machel  
281-960-1244

## How to Prepare for Emergencies – continued

Everyone gets local emergency numbers. "Most plants have trained emergency brigades or they're close to a local ambulance," says Tellish. "They'll show up fast if you know who to call."

**Follow the plan.** National Vacuum crews start the day with a short tailgate meeting. They go over hazards and solutions, such as where to park to keep visual contact or whether to tie off when working on metal grating in snow.

"That's the reason for all this training," he says. "We give every worker the tools to make smart safety decisions."

“If the public is depending on you to perform, you don't want to be the missing cog on the gear. You have to come through.”

# Decals Reinforce Safety Message

Everyone needs to exercise caution when working around water blasters. A universal safety warning kit developed by Jetstream could help.

The kit contains 28 decals designed for waterjet equipment and components that require heightened safety awareness. Contractors can apply to any waterblast unit, regardless of make or model.

Jetstream consulted with hazard warning experts to come up with the design. The resulting labels combine maximum operator visibility with short, clear printed warnings. They also contain internationally recognized pictograms and symbols, a must given today's multicultural workforce.

Warning areas range from towing and tires to belt guard burst hazards and fuel. The set also includes a general label that highlights the inherent dangers of high-pressure water and provides a checklist to follow before turning on the pump.

"We developed these decal kits to improve hazard notification throughout the industry," says Jetstream general manager Ron Schmidt.

In addition to increasing awareness of hazards and their prevention, Schmidt hopes the labels will simplify training of new operators and satisfy the legal obligation to warn of potential hazards.

"Our goal is to have all waterblast suppliers adopt these warnings and incorporate them on their equipment so they become an industry standard," he says.

Each set of decals comes with a warning label installation and location guide.

To order your Safety Warning Decal Kit, call Jetstream at 800-231-8192.



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