



## 2015 Course & Services Catalog



**Is Your Workplace  
Safe & Efficient?**



Welcome from



FS Solutions, an integral part of Federal Signal's Environmental Solutions Group, offers state-of-the-art training in a variety of venues from on-demand to onsite training to enable you to keep your employees safe and productive.

We are the industry leaders in the manufacture, sales, rental and servicing of High Pressure Waterblast Equipment, Industrial Vacuum Equipment, Hydro Excavators and Sewer Cleaning Equipment. From our manufacturing facilities in Illinois and Texas and our FS Solution Service Centers in California, Illinois, Indiana, New Jersey, Texas, Louisiana, Alabama, Washington and Ohio, we can also offer convenient access to parts, accessories and training.

Our certified instructors are committed to offering you the best, most up-to-date training, regardless of venue. We also believe strongly in customizing our courses for your customer base, equipment and personnel skill levels.

Whether we see you at Your Site, in one of our FS Solution Centers, a Public Offering or an Online Offering, we welcome you and look forward to seeing you in class!

A handwritten signature in black ink, appearing to read 'Gary W. Toothe'.

Gary W. Toothe, CET  
Training Manager, FS Solutions



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# The FS Solutions Advantage

## Courses

Safety & Skills classes have been developed by Gary W. Toothe, a Certified Environmental, Safety & Health Trainer (CET) and a Master Trainer through the National Center for Construction Education & Research (NCCER).

## Training Environment

All classes have been developed to teach both knowledge and skills. All live classes are held in a comfortable classroom setting for the knowledge portion of the training and will then move to actual use of the material learned, either on an FS Solutions Simulator, client owned equipment, or classroom simulations, as is appropriate.

Students attending classes need to have appropriate work and safety gear for any training requiring hands-on equipment use.

## Student Materials

Students will be provided with handouts of all materials presented. Upon successful completion of the class Course Cards will be stamped with the Instructor's Certification and all Course Certificates can be embossed with the Instructor's Seal of Certification.

## Instructors

Instructors will be qualified and competent in all subjects taught. Instructor qualifications are available upon request for any scheduled training.

All hands-on training will include an instructor manned safety device to protect students learning new skills.

## Copyright Information

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# OSHA CONSTRUCTION



10 Hour Classes • 30 Hour Classes • Individual Subjects

## **OSHA 10-Hour Construction**

**2 Days**

**Maximum 20 Students**

Upon the successful completion of this course the student will receive a 10-hour Occupational Safety and Health Training Course card in Construction Safety and Health.

Mandatory training topics

- Introduction to OSHA – 2 Hours
- OSHA Focus Four Hazards – 4 Hours
- Personal Protective and Lifesaving Equipment – 30 Minutes
- Health Hazards in Construction – 30 Minutes

Electives – 2 Hours from the following topics, 30 Minutes minimum per topic

- Materials Handling, Storage, Use and Disposal
- Tools – Hand and Power
- Scaffolds
- Stairways and Ladders
- Trenches and Excavations

Optional – 1 Hour, 30 minutes minimum per topic

- Any other construction hazard or expansion of mandatory or elective topics.

## **OSHA 30-Hour Construction**

**4 Days**

**Maximum 20 Students**

Upon the successful completion of this course the student will receive a 30-hour Occupational Safety and Health Training Course card in Construction Safety and Health.

Mandatory topics are:

- Introduction to OSHA – 2 Hours
- Managing Safety & Health – 2 Hours
- OSHA Focus Four Hazards – 6 Hours
- Personal Protective and Lifesaving Equipment – 2 Hours
- Health Hazards in Construction – 2 Hours
- Stairways and Ladders – 1 Hour

Electives – 12 Hours with at least 6 from the following topics, 30 minutes minimum per topic.

- Confined Space Entry
- Ergonomics
- Excavations
- Fire Protection and Prevention
- Materials Handling, Storage, Use and Disposal
- Powered Industrial Vehicles
- Safety and Health Program
- Scaffolds
- Tools - Hand and Power

Optional – 3 Hours, 30 minutes minimum per topic

- Any other construction hazard or expansion of mandatory or elective topics



**Trenching and Excavation**  
**Competent Person**

**1 Day**

**Maximum 20 Students**

A detailed look at OSHA's Trenching & Excavation Standard, covering: Soil Mechanics, Soil Classification, Soils Testing, Sloping & Benching, Shoring & Protective Systems, Safety Hazards, Requirements of the Standard and the Duties of the Competent Person.

Regulatory trigger depths, disturbed soils, utility location and support, hazard increasing occurrences and portable shoring systems will be covered in depth. Additionally, the pertinent requirements under OSHA relating to hydro-excavation will be detailed. Successful completion of this class will meet the requirements for Competent Person once the individual has been given authority by their Company.

**Other OSHA Safety Classes**

**2 Hours Each**

**Maximum 20 Students**

- Subpart E – Personal Protective & Lifesaving Equipment
- Subpart F – Fire Protection & Prevention
- Subpart I – Hand & Power Tools
- Subpart K – Electrical
- Subpart L – Scaffolds
- Subpart M – Fall Protection
- Subpart P – Excavations
- Subpart X – Ladders

Other Construction Classes (Subparts A – Z), not listed above, are available upon request



# OSHA GENERAL INDUSTRY



10 Hour Classes • 30 Hour Classes • Individual Subjects

**OSHA 10-Hour General Industry****2 Days****Maximum 20 Students**

Upon the successful completion of this course the student will receive a 10-hour Occupational Safety and Health Training Course card in General Industry Safety and Health.

Mandatory topics:

- Introduction to OSHA – 2 Hours
- Walking and Working Surfaces, including Fall Protection – 1 Hour
- Emergency Action Plans, Exit Routes, Fire Protection and Fire Prevention – 1 Hour
- Electrical – 1 Hour
- Personal Protective Equipment – 1 Hour
- Hazard Communication – 1 Hour

Electives – 2 Hours from the following topics, 30 Minutes minimum per topic

- Hazardous Materials
- Materials Handling
- Machine Guarding
- Introduction to Industrial Hygiene
- Blood borne Pathogens
- Ergonomics
- Safety and Health Programs
- Fall Protection

Optional – 1 Hour, 30 Minutes minimum per topic

- Any other general industry hazard or expansion of mandatory or elective topics

**OSHA 30-Hour General Industry****4 Days****Maximum 20 Students**

Upon the successful completion of this course the student will receive a 30-hour Occupational Safety and Health Training Course card in General Industry Safety and Health.

Mandatory topics:

- Introduction to OSHA (2 hour min.)
- Walking and Working Surfaces, including Fall Protection – 1 Hour
- Managing Safety & Health – 2 Hours
- Emergency Action Plans, Exit Routes, Fire Protection and Fire Prevention – 2 Hours
- Electrical – 2 Hours
- Personal Protective Equipment – 1 Hour
- Materials Handling – 2 Hour
- Hazard Communication – 1 Hour

Electives – 10 Hours at least 5 from the following topics, 30 minutes minimum per topic

- Hazardous Materials
- Permit-Required Confined Spaces
- Lockout/Tagout
- Machine Guarding
- Introduction to Industrial Hygiene
- Blood borne Pathogens
- Ergonomics
- Fall Protection
- Safety and Health Programs
- Powered Industrial Vehicles

Optional – 7 Hours, 30 minutes minimum per topic

**Confined Space Competent Person****1 Day****Maximum 20 Students**

A detailed review of Permit Required Confined Spaces and Confined Space Supervisory responsibilities under OSHA's Confined Space Standard. Topics include: An Introduction to Confined Spaces, Confined Space Hazards, Permit Required Confined Spaces, Confined Space Hazard Controls, Atmosphere Sampling, Confined Space Rescue and Industries and Applications having Special Considerations.

Complete space air sampling, communication methods, rescue requirements, proper monitor operations and calibration requirements, as well as, personnel duties will be covered in depth. Successful completion of this class will meet the requirements for Competent Person once the individual has been given authority by their Company.

**Other OSHA Safety Classes****2 Hours Each****Maximum 20 Students**

- Back Injury Prevention/Ergonomics
- Blood borne Pathogens
- Confined Space Entry
- Electrical Safety
- Fall Protection
- Emergency Action Plans
- Fire Prevention, Fire Safety and Fire Extinguishers
- Hand and Power Tool Safety
- Hazard Communication and Hazardous Materials
- Heat & Cold Stress
- Ladders & Stairways
- Lockout/Tag out
- Machine Guarding
- Personal Protective Equipment and Hearing Conservation
- Powered Industrial Truck Overview
- Respiratory Protection
- Scaffold User
- Trenching and Excavation
- Walking and Working Surfaces

This course satisfies the OSHA requirements for HAZWOPER Site Operations training.

Topics Covered Include:

- HAZWOPER Overview
- Toxicology
- Confinement, Containment & Sorbents
- Chemistry of Hazardous Materials
- Respiratory Protection
- Chemical Protective Clothing
- Decontamination
- Applicable DOT Regulations
- Incident Command System, National Incident Management System
- Air Sampling & Monitoring
- Environmental Sampling
- Communications
- Emergency Response Guidebook
- Spill Response

Exercises Include:

- Communicating Under Adverse Conditions
- Establishing a Decontamination Station
- Use of SCBA
- Defensive & Offensive Spill Responses
- Stimulated Spill Response (Coached)

Testing will be comprised of:

- Final Exam
- Simulated Spill Response (Field Exercise)

Upon the successful completion of this course and exam, the student will receive a Certificate of Training stating they have demonstrated competency at the Site Operations Level and referencing the appropriate OSHA/EPA Regulations.

**HAZWOPER 24-Hour  
Technician Level**

**3 Days**

**Maximum 12 Students**

This course satisfies the OSHA requirements for HAZWOPER Technician Level training.

Topics Covered Include:

- HAZWOPER Overview
- Chemistry of Hazardous Materials
- Applicable DOT Regulations
- Emergency Response Guidebook
- Respiratory Protection
- Chemical Protective Materials, PPE & Suits
- Air Sampling & Monitoring
- Toxicology
- Decontamination
- Spill Response
- National Incident Management System (NIMS)

Exercises Include:

- Communicating Under Adverse Conditions
- Establishing a Decontamination Station
- Use of SCBA
- Defensive & Offensive Spill Responses

Testing will be comprised of:

- Final Exam
- Simulated Spill Response (Field Exercise)

Upon the successful completion of this course and exam, the student will receive a Certificate of Training stating they have demonstrated competency at the Technician Level and referencing the appropriate OSHA/EPA Regulations.

**HAZWOPER 8-Hour Update**

**10-Hour Day**

**Maximum 20 Students**

This course satisfies the HAZWOPER requirement for annual refresher training. The course incorporates a review of the HAZWOPER standards and an update of changes to the standard within the past year.

This course must be taken annually.

Upon the successful completion of this course the student will receive a Certificate of Training referencing the appropriate OSHA/EPA Regulations.

This course covers OSHA's Combustible Dust National Emphasis Program (CPL 03-00-008), what is involved, who is involved and how to insure compliance.

Topics covered include:

- National Compliance Directive CPL 03-00-008
- History of Combustible Dust Explosions
- Target Industries
- What OSHA is Looking For
- Possible Citations
- Dust Explosion Chemistry & Physics
- Deflagrations
- The Four Conditions Required for a Combustible Dust Explosion
- Hazard Recognition
- Dust Collection Systems & Associated Hazards
- Explosion Hazard Management
- Hazard Assessment
- Preventing the Deflagration
- Maintaining a Safe Workplace
- Training Required
- Electrical Classifications

Classes taught 'on-site' can include a walkthrough to identify potential hazards.



# EQUIPMENT SCHOOLS



**VACTOR**<sup>®</sup>  
Subsidiary of Federal Signal Corporation



**GUZZLER**<sup>®</sup>  
Subsidiary of Federal Signal Corporation



**Jetstream**<sup>®</sup>  
Subsidiary of Federal Signal Corporation

## VECTOR 2100 PLUS OPERATORS

### Objectives:

This 3 day class is designed to help operators and new mechanics set and maintain the Vector 2100 Plus for the best operation. Engaging the hydraulics, rodder pump and vacuum systems (fan and PD units) will be discussed with emphasis on safety, proper operation, maintenance, and repair. Class will include basic troubleshooting of electrical and hydraulic systems related to sewer cleaning. We will discuss use of troubleshooting of the boom and high pressure water system. Discussion will include how to set the Vector unit up for various applications.



- Pretrip unit inspections
- Arriving at the job site and man hole setup
- Job site safety
- Nozzle selection and step cleaning
- Setting and Operating the Nozzle(s)
- Troubleshooting the rodder pump
- Clean fill techniques
- Options used for specific application
- Hose reel basics
- Boom systems and options
- Filtration and vacuum systems
- Dumping the load
- Wash down at the dump site and seal inspection
- Maintenance and Maintenance Schedule
- Winterization

Who should attend: New and experienced operators, new mechanics who want a better understanding of the Vector 2100 Plus

Class size is limited to 15 Students

Registration is online at: <http://esgtechtraining.eventbrite.com/>

Location: Vector Manufacturing Training Center  
1621 S. Illinois Street  
Streator, IL 61364



Scan here to register.

# VECTOR

## VECTOR 2100 PLUS MECHANICS

### Objectives:

This 4 day class will give experienced mechanics operational information to confirm diagnosis, repair, maintenance and system troubleshooting. We will spend approximately half the time in the hands-on lab and the other half in a lecture setting. Mechanics will learn how to troubleshoot the rodder pump, hose reel, boom systems, vacuum systems, hydraulic, pneumatic and electrical/electronic systems. Mechanics will disassemble the rodder pump, fan and transfer cases used in their Vector units. The technicians will make a repair to the thermoplastic hose and test it. We will demonstrate the proper use of the flow meter and pressure gauge for water system diagnostics.



- Basic operation for repair confirmation
- Understand hose reel, rodder pump, boom and Intelliview function
- Intelliview for diagnostic assistance
- How to use the diagnostic manual
- How to manually override hydraulic and pneumatic functions
- Electrical/electronic troubleshooting, diagnostics and repairs
- Diagnose rodder pump problems and failures
- Rodder pump rebuild
- Diagnose vacuum related problems
- Blower inspection and fan rebuild
- Hydraulic component identification

Who should attend: New and experienced mechanics that need to have a better understanding of Vector 2100 Plus repair procedures and recommendations.

Class size limited to 15 Students.

Registration online at: <http://esgtechtraining.eventbrite.com/>

Location: Vector Manufacturing Training Center  
1621 S. Illinois Street  
Streator, IL 61364



Scan here to register.

# VECTOR

## GUZZLER CL

### Objectives:

This 3 day class will give new and experienced mechanics operational to confirm diagnosis, repair, maintenance and system troubleshooting. We will spend approximately half the time in the hands-on lab and the other half in a lecture setting. Mechanics will learn how to troubleshoot the boom systems,



vacuum systems, hydraulic, pneumatic and electrical/electronic systems. Mechanics will disassemble the fan and transfer cases used in their Guzzler units. Perform a blower inspection.

- Basic operation for repair confirmation
- Intelliview function
- Intelliview for diagnostic assistance
- How to use the diagnostic manual
- How to manually override hydraulic and pneumatic functions
- Electrical/electronic troubleshooting, diagnostics and repairs
- Diagnose vacuum related problems
- Blower inspection and fan rebuild
- Hydraulic component identification

Who should attend: New and experienced mechanics that need to have a better understanding of Guzzler repair procedures and recommendations.

Please note: The first ½ day is for operators and the remaining 2 ½ days will be for mechanics.

Class size is limited to 15 Students.

Registration is online at: <http://esgtechtraining.eventbrite.com/>

Location: Vactor Manufacturing Training Center  
1621 S. Illinois Street  
Streator, IL 61364



Scan here to register.



## GUZZLER NX

### Objectives:

This 3 day class will give new and experienced mechanics operational to confirm diagnosis, repair, maintenance and system troubleshooting. We will spend approximately half the time in the hands-on lab and the other half in a lecture setting. Mechanics will learn how to troubleshoot the boom systems, vacuum systems, hydraulic, pneumatic and electrical/electronic systems. Mechanics will disassemble the fan and transfer cases used in their Guzzler units. Perform a blower inspection.



- Basic operation for repair confirmation
- Intelliview function
- Intelliview for diagnostic assistance
- How to use the diagnostic manual
- How to manually override hydraulic and pneumatic functions
- Electrical/electronic troubleshooting, diagnostics and repairs
- Diagnose vacuum related problems
- Blower inspection and fan rebuild
- Hydraulic component identification

Who should attend: New and experienced mechanics that need to have a better understanding of Guzzler repair procedures and recommendations.

Please note: The first ½ day is for operators and the remaining 2 ½ days will be for mechanics.

Class size is limited to 15 Students.

Registration is online at: <http://esgtechtraining.eventbrite.com/>

Location: Vactor Manufacturing Training Center  
1621 S. Illinois Street  
Streator, IL 61364



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## VACTOR HXX II

### Objectives:

This 3 day class will give new and experienced mechanics operational to confirm diagnosis, repair, maintenance and system troubleshooting. We will spend approximately half the time in the hands-on lab and the other half in a lecture setting. Mechanics will learn how to troubleshoot the high pressure CAT pump, boom systems, vacuum systems, hydraulic, pneumatic and electrical/electronic systems. Mechanics will disassemble the head on the CAT pump, fan and transfer cases used in their HXX units. Perform a blower inspection.



- Basic operation for repair confirmation
- Intelliview function
- Intelliview for diagnostic assistance
- How to use the diagnostic manual
- How to manually override hydraulic and pneumatic functions
- Electrical/electronic troubleshooting, diagnostics and repair
- Diagnose CAT pump problems and failures
- CAT pump head rebuild
- Diagnose vacuum related problems
- Blower inspection and fan rebuild
- Hydraulic component identification
- Winterization

Who should attend: New and experienced mechanics that need to have a better understanding of HXX II repair procedures and recommendations.

Please note: The first ½ day is for operators and the remaining 2 ½ days will be for mechanics.

Class size is limited to 15 Students.

Registration is online at: <http://esgtechtraining.eventbrite.com/>

Location: Vactor Manufacturing Training Center  
1621 S. Illinois Street  
Streator, IL 61364



Scan here to register.

# VACTOR

## REQUEST FOR FIELD TRAINING FOR ELGIN, VACTOR, OR GUZZLER PRODUCTS

Field training is available for dealers or customers (end users) on all products. Mechanics training or a combination of operator/maintenance training is available.

The cost for field training is the same regardless of product. First day in a location is \$2500 per trainer, each additional day in the same location is \$1500 per trainer. Please discuss location with your Regional Service & Parts Manager (RSPM) for approval.

The dealer must fill out the Request for Field Training form. All requests must be received a minimum of ninety (90) days before any requested date.

Register your request at the following <http://requestfieldtraining.eventbrite.com>

### Host's Responsibility:

- Dealer is responsible to register all attendees with our on-line registration program.
- Obtain approved school start and completion dates from RSPM.
- Coordinate all matters concerning attendance.
- Provide adequate meeting space for presentations using screen and assure writing space for all attendees, as agreed upon with RSPM.
- Have a unit or units on hand at training site for around training sessions.
- Provide presentation equipment (projector, screen, flip chart). Ensure meeting room is setup and maintained for duration of the meeting.
- Provide all refreshments and/or meals for attendees.
- Provide sign-in sheet of all attendees to trainer.
- Purchase completed training manuals from ESG or print and assemble training manuals for all attendees using copy masters provided.

### Trainer's Responsibility:

- Provide presentation materials for video, projector, slide, or overhead presentation.
- Make available training manuals for purchase from ESG or provide copy master for creation of train manuals for each attendee. (Copy materials are to be sent to dealer contact at least two weeks before school).



## JETSTREAM “A” SCHOOL

### Safe Operation & Maintenance Training Class:

This course covers the safe operation, maintenance, troubleshooting, physical application and safety issues of the various areas of the Jetstream unit. Topics to be discussed include safe pump operation, maintenance, the UNx system (10k, 20k, and 40k), swapping fluid ends, waterblast guns, pedals & accessories, univalves and packing, disassembly, repair and re-lapping, preventive maintenance and winterization. The class will also cover hoses, lances, nozzles and recommended spare parts.

The course combines extensive hands-on training with classroom instruction and is recommended for maintenance personnel, operators and supervisors. Classes will be tailored towards the objectives of those in attendance.

**Class Length:** 3 days

**Class Size:** Max 10 students

**Location:**

This class is held at the Jetstream Manufacturing Training Center in Houston, TX

“Learning about all the prudent maintenance procedures that will help extend the life of our valuable equipment was well worth it.”

“The knowledge we acquired about our pump and its proper operation has proven to be invaluable to our company already.”

### For more information and pricing, contact:

**Bill Slovak**

p 832.590.1365 c 713.301.7119  
bslovak@waterblast.com

**Ellery Bynum**

p 832.590.1303 c 832.524.4560  
ebynum@waterblast.com

\*Arrangements can be made to have the class taught at a suitably equipped facility at a customer site.





# INDUSTRIAL SERVICES



Safety • Skills • Proper Operation • Maintenance & Trouble Shooting

**Vacuum/Air Moving  
Fundamentals, Safety & Skills**

**1 Day**

**Maximum 20 Students**

This course covers the basics of how to use Industrial Vacuum Units (Liquid Vacuum Tankers & Trailers, Air movers and Vacuum Excavation units) for the technician (hose man). It also covers Vacuum Safety as found in "The Recommended Practices for the Use of Industrial Vacuum Equipment" published by the WaterJet Technology Association.

Time will be split between the classroom and 'Hands-On' experience with Industrial Vacuum Units and their Safety Devices.

Students will be expected to successfully complete both knowledge testing and 'Hands-On' skills verifications in: job set-up and break-down, nozzle & hose selection, basic knot tying, proper loading techniques, safe vehicle guiding and truck cleaning.

**Advanced Vacuum/Air Moving Skills  
For The Technician**

**1 Day**

**Maximum 10 Students**

This class is designed to advance the skill levels of current vacuum employees. The class can also be used to teach new techniques, equipment or applications to the workforce before they are introduced in customer applications. This class is a prerequisite for Supervisory Skills Training. Topics covered include:

- Review of Vacuum Safety
- Vacuum Theory and Application
- Evaluation of Job Situations and Solutions for the Technician
- Capabilities and Applications for Vacuum Accessories
- Introduction to Industrial Vacuum Units for the Operator Trainee
- Field Training and Evaluation of Learned Skills

**Vacuum Unit Operator Skills  
Operation, Maintenance & Troubleshooting**

**1 Day**

**Maximum 10 Students**

Operator Skills Training is designed to hone the skills of current unit operators and to teach the skills of proper equipment operation to those employees that have the ability to drive the equipment. The class is therefore offered as both an advanced class, to those employees that have successfully obtained their CDL, but have not yet learned the skills to operate the equipment, and as a review and upgrade class for current vacuum unit operators.

Topics covered include:

- Review of New and Existing Vacuum Equipment and Accessories
- Review of Vacuum Safety
- Advanced Vacuum Theory and Application
- Evaluation of Job Situations and Solutions for the Operator
- Capabilities and Applications for Vacuum Units and Accessories
- Advanced Industrial Vacuum Unit Operation, Maintenance and Troubleshooting
- Field Training and Evaluation of Learned Skills

**Using An Air Mover In Combustible  
Dust Service**

**1 Day**

**Maximum 20 Students**

A primer on Industrial Vacuum Trucks, followed by an in depth analysis of how Air Movers load materials and the flow paths through the units. Followed by a synopsis of OSHA's National Compliance Directive on Combustible Dust and how it impacts the use of an Air Mover in Combustible Dust service.

## Using An Air Mover In Combustible Dust Service Continued

Focus will then be on those procedures and conditions which are critical to the safe operation of the unit when handling a Combustible Dust and why other ways are dangerous.

Students will then spend times hands-on with the units and setting up an Assured Ground system.

## Vacuumping Of Flammable And Combustible Liquids

**1 Day**

**Maximum 20 Students**

A primer on Industrial Vacuum Trucks, followed by an in depth analysis of how Air Movers and Liquid Vacuum Trucks load materials and the flow paths through the units. Guzzler Pneumatic Vacuum Loaders will be examined with comparisons of the similarities and differences between 'Classic' Pneumatic Loaders and Liquid Ring units.

Safety and operational considerations in the selection of a vacuum unit to handle flammable and combustibles liquids will be reviewed. The regulatory requirements of OSHA, the American Petroleum Institute (API 2219) and recommendations of the Chemical Safety Board (CSB) will also be examined.

Finally proper job setup for each type unit and material will be discussed, as well as, resources available for teaching and compliance, both in print and online.

## Waterblast Fundamentals, Safety & Skills

**2 Days**

**Maximum 20 Students**

This course covers the basics of how to use a standard waterblaster for the technician (hose man). Topics include an introduction to proper job set up, tip selection, job performance issues and job breakdown.

This course also covers the requirements for the safe use of high pressure waterblasting equipment at pressures up to 20,000 psi, based on "The Recommended Practices for the Use of Manually Operated High Pressure Waterjetting Equipment" published by the WaterJet Technology Association.

Time will be split between the classroom and 'hands-on' experience with high pressure units and their safety devices.

Students will be expected to successfully complete knowledge testing and 'Hands-On' skills verifications in: Job Set-up and Break-down, Pipe Cleaning (including floor drains), Horizontal & Vertical Tube Cleaning, Stiff Lancing and Shotgun Cleaning.

## Advanced Waterblast Skills For The Technician

**1 Day**

**Maximum 10 Students**

This class is designed to advance the skill levels of current waterblast employees. The class can also be used to teach new techniques, equipment or applications to the workforce before they are introduced in customer applications. This class is a prerequisite for Supervisory Skills Training.

Topics covered include:

- Review of Waterblast Safety
- Waterblast Theory and Application
- Evaluation of Job Situations and Solutions for the Technician
- Capabilities and Applications for Waterblast Accessories
- Introduction to Waterblasting Units for the Operator Trainee
- Field Training and Evaluation of Learned Skills

**Waterblast Unit Operator Skills  
Operation, Maintenance & Troubleshooting**

**1 Day**

**Maximum 10 Students**

Operator Skills Training is designed to hone the skills of current unit operators and to teach the skills of proper equipment operation to those employees that have the ability to drive or tow the equipment. The class is therefore offered as both an advanced class, to those employees that have successfully obtained their CDL, but have not yet learned the skills to operate the equipment, and as a review and upgrade class for current waterblast unit operators.

Topics covered include:

- Review of New and Existing Waterblast Equipment and Accessories
- Review of Waterblast Safety
- Advanced Waterblast Theory and Applications, Including Tip Selection
- Evaluation of Job Situations and Solutions for the Operator
- Capabilities and Applications for Waterblast Units and Accessories
- Advanced Waterblast Unit Operation, Maintenance and Troubleshooting
- Field Training and Evaluation of Learned Skills

**Advanced Waterblast Issues Workshop**

**1 Day**

**Maximum 20 Students**

This class focuses on bringing maximum effective horsepower of the waterblast pump to bear on your cleaning task.

Students will learn how to:

- Determine actual cleaning pressures
- Maximize flow
- Calculate pressure losses
- Calculate back pressure
- Determine effective Jet 'throw'
- Select the proper tip design
- Order the proper tips and lances
- Determine how far a tip will pull a lance into a pipe
- Determine impact force at a distance for 3D nozzles
- Properly torque connections

We will also discuss:

- How to properly setup a waterblast job
- How to properly setup a Multi-Gun Valve
- How to troubleshoot a waterblast unit
- The Safety Hierarchy in waterblasting
- The importance of proper filtration and pre-job inspections

Students will be given form and sample programs to aid them in all of the above tasks.

Students will be expected to use all of the tools and aids in small groups during the afternoon of the workshop, with the goal of mastering their use.

**NCCER Hydroblasting****3 Day****Maximum 24 Students**

“Using the sheer force of water at pressures between 10,000 and 20,000 psi, or even ultra high- pressure water blasting up to 40,000 psi, a hydroblaster’s job is not only risky, but irreplaceable once you receive proper training and experience. Jets of high-pressure water are used to clean tanks, boilers, remove paint, and perform numerous maintenance functions necessary for achieving high-quality operations at various industries. This module describes the safety procedures, basic techniques, and theory of hydroblasting, including confined spaces, manlifts, and the use of pumps and waterjet equipment.”

Newly revised in 2012, NCCER Hydroblasting contains 11 Chapters and 3 Appendices related to High Pressure Hydroblasting. Students must pass both a written exam and a “Hands-On” Skills Assessment before receiving their Certification.

Student Handbooks must be purchased for each Student and there may be per student a filing fee.

**Hydro Excavation Safety & Productivity****1 Day****Maximum 20 Students**

This class focuses on the safety requirements of any trench or excavation, in addition to the unique hazards created when Hydro Excavating, In addition, the proper: set-up, operations, excavation techniques and load handling will be discussed.

Topics include:

- Excavation & Trenching Primer for Hydro Excavation
- Hydro Excavation Safety Issues
- Waterblast Safety (Hand-gunning)
- Vacuum Safety
- Hydro Excavation Efficient Operation

**Combination Sewer Cleaner Operations****1 Day****Maximum 20 Students**

This class covers the proper operations and safety considerations involved in the use of a Combination Style Sewer Cleaner. This course covers both Fan Style and Positive Displacement Blower units.

Topics include:

- Traffic control
- Proper Truck Filling
- Fire Hydrant Procedures
- Boom Positioning
- Hoses, Fittings & Hose Reel
- Anti-Reversal & Anti-Withdrawal
- Nozzle Styles & Uses



# JOB SITE MANAGEMENT



Beginning Skills • Advanced Skills • Estimating  
Intro to Industry • Quality

**First Time Supervisor Skills****3 Days****Maximum 20 Students**

First Time Supervisor Skills Training is designed to hone the skills of current supervisors and to teach the supervisory skills required to become a successful supervisor to those individuals eligible for promotion.

Topics covered include:

**Supervisory Skills**

- Communication Styles
- Principles of Motivation
- Interpersonal Skills
- Safety Responsibilities
- Effective Discipline
- Employee Performance Issues
- Employee Work Habit Issues
- Handling Employee Complaints
- Performing Employee Performance Appraisals
- The Supervisor as Trainer

**Job Site Skills**

- Pre-Job Planning
- Job Site Set-Up
- Completing Required Job Paperwork

**Customer Interaction Skills**

- Task Verification
- Safety Issues
- Performance Issues
- How to Deal with an Irate Customer

This course is a prerequisite for Advanced Supervisory Skills.

**Shutdown And Project Planning  
And Management Workshop****1 Day****Maximum 20 Students**

This workshop will take the student from preparing for a pre-bid meeting through to the successful completion of a large project of customer shutdown.

Topics include: Preparing for the bid meeting, Public and private questions, How to know what the equipment condition will be, Outage planning, Equipment and manpower utilizations and Preparing the bid. Once the project has been successfully bid, students will learn: Outage Pre-Planning, Selecting who is on what shift, Outage Staging, Keeping the shutdown manager out of the details, Tracking outage tasks, Effective shift turnovers, and Managing timelines.

Students will be given form and sample programs to aid them in all of the above tasks.

Students will be expected to use all of the tools and aids in small groups during the afternoon of the workshop, with the goal of mastering their use.



### **Advanced Supervisor Skills**

**2 Days**

**Maximum 20 Students**

The Advanced Supervisor Skills Training is designed to take current front line supervisor to the next level of field management.

Topics covered include:

- Mentoring Skills for Supervisors
- The Hazard You Didn't See
- Human Performance Training
- Safety Review
- Supervisor Safety Incident Management Training
- Time Sheets, Change Orders & Job Logs
- Paperwork Scenarios
- How Clean is Clean? Verifying the Scope-of-Work
- Dealing with an Irate Customer
- How to "Kick It Up a Notch" Professionally
- The Internal Customer
- Job Safety Analyses (JSA)
- Job Hazard Analyses (JHA)
- Standard Operating Procedures (SOP)
- Outage Planning Procedures
- Successful Shift Turnovers
- Shutdown/Outage/Turnaround Quality Monitoring Program
- Vacuum Load Dump Procedures
- Waterblast Variance Procedures

### **Estimating Workshop for Vacuuming & Waterblasting**

**4-6 Hours**

**Maximum 10 Students**

This workshop covers the basic mathematic and geometric principles in determining volume, square footage and linear feet of objects to be waterblasted or vacuumed.

Vacuum estimation stresses cycle times, realistic truck capacities and the above mathematics to enable the student to successfully estimate production times on vacuum jobs. These skills can also be used to analyze job productions to determine if the job is being performed at maximum efficiency.

Waterblast estimation stresses calculation of square feet per hour, tubes per hour and linear feet per hour for differing waterblast applications. The waterblast horsepower relationship, pressure loss, nozzle thrusts and the means of calculating how far a lance can be pulled into a pipe will all be covered. The production times of various alternative cleaning methods will also be discussed. Time will be allowed to cover student's examples from their workplace.



# SALES



Introduction to Industry • Estimating • Bidding

**Estimating Workshop for  
Vacuuming & Waterblasting**

**4-6 Hours**

**Maximum 10 Students\**

This workshop covers the basic mathematic and geometric principles in determining volume, square footage and linear feet of objects to be waterblasted or vacuumed.

Vacuum estimation stresses cycle times, realistic truck capacities and the above mathematics to enable the student to successfully estimate production times on vacuum jobs. These skills can also be used to analyze job productions to determine if the job is being performed at maximum efficiency.

Waterblast estimation stresses calculation of square feet per hour, tubes per hour and linear feet per hour for differing waterblast applications. The waterblast horsepower relationship, pressure loss, nozzle thrusts and the means of calculating how far a lance can be pulled into a pipe will all be covered. The production times of various alternative cleaning methods will also be discussed. Time will be allowed to cover student's examples from their workplace.

**Lump Sum Bidding for  
Vacuuming & Waterblasting**

**4-6 Hours**

**Maximum 10 Students**

The Estimating Workshop is a prerequisite for taking this class.

This workshop involves the research, calculation and preparation of lump sum bids for virtually all vacuum and waterblast situations. Determining project fixed costs, variable, and durations will be covered. Students will be given sample copies of several Project Planning Sheets.

Bid preparation will be covered with potential formats, target audiences, Identification of Needs, Recommended Solutions, Responsibilities of the Parties, Pricing and Boilerplate issues to protect the bidder. Time will be allowed to cover student's examples from their workplace.

**Combined Estimating &  
Bidding Workshop**

**1 Day**

**Maximum 10 Students**

This class is a back-to-back combination of the Estimating and Lump Sum Bidding Classes. All of the material in both classes will be covered and if there is time remaining, there will be an opportunity to cover student's examples from their workplace.

# ON DEMAND COURSES



FS Solutions has the ability to offer On-Demand courses through our ESG University. Scan the QR code provided here to register for these On-Demand courses.



Scan here to register.

## **On-Demand Courses**

### **Fundamentals of Waterblast Theory, Fundamentals and Safety**

This curriculum focuses on the Fundamentals of Waterblast Theory, Fundamentals and Safety. The curriculum contains four modules with quizzes which must be successfully completed in order to move on to the next module. In the beginning module we'll define the basics of waterblasting, including the history, how a waterblaster works, how high pressure works, general safety considerations and an introduction to trouble shooting. In module 2 - we'll talk about the specific safety rules common to all waterblasting jobs. In module 3 - we'll begin talking about the specific safety rules for pipe cleaning, and tube lancing, and in Module 4 – we will finish the presentation with stiff lancing, shotgun cleaning and what to do with automatic tools, and when certain rules cannot be followed, and what to do when that happens.

### **Maximize Power of WaterJetter through Tip and Hose Selection**

The WaterBlast Fundamentals curriculum is required prior to this course. This Maximizing Power course (\$75) covers the basic concepts of: Understanding the horsepower formula; Using the horsepower formula to solve for pressure, flow and horsepower; Understanding the components of tip design; Understanding the factors effecting tip performance And understanding the unique issues in pipe cleaning, tube cleaning, shot gun cleaning and automatic tool cleaning. These skills can also be used to analyze job productions to determine what equipment is required to perform at maximum efficiency.

### **Vacuum and Air Moving Fundamentals, Safety and Skills**

This training course is comprised of two modules. In the first module you will know the (1) difference between liquid vacuum units and air movers, (2) how both liquid vacuum units and air movers work, the (3) science of industrial vacuuming, and (4) proper vacuum job procedures. In Module number 2 we will spend an extensive amount of time talking (5) about vacuum safety considerations.

### **Estimating the Vacuum Job**

Prior to this course the Vacuum/Air Moving Fundamentals curriculum is required. (\$75) This Estimating the Vacuum job course focuses on the basic mathematic and geometric principles in determining volume, square foot and linear feet of objects to be vacuumed. Vacuum estimation stresses cycle times, realistic truck capacities and the above mathematics to enable the student to successfully estimate production times on vacuum jobs. These skills can also be used to analyze job production to determine if the job is being performed at maximum efficiency.

### **Fundamentals of Hydro-Excavation Safety and Skills**

This is a two module course that covers the unique challenges associated with Hydro-Excavating. Module One outlines the hazards and safety regulations applicable to excavations. Beginning with basic definitions and continuing through excavation competent person responsibilities, this module insures the student is familiar with excavations prior to discussing the Hydro-Excavation method of excavation. Module Two focuses strictly on the Hydro-Excavation method of digging. From the safety challenges the Hydro-Excavator brings to the job, through the application of the Hydro-Excavating, to the maximizing of efficiency and productivity on the Hydro-Excavator project, this module insures the student is familiar with the specific method of Hydro-Excavation.

# ADDITIONAL SERVICES



Check [www.fssolutionsgroup.com](http://www.fssolutionsgroup.com) for schedule

## **Train-the-Trainer Classes**

## **Variable**

## **Maximum 5 Students**

Train- the - Trainer classes are available for all of the classes listed in the course catalog EXCEPT OSHA classes.

Students must pass the class they wish to become a trainer in prior to enrolling in the Trainer Class.

The trainer class is a detailed look at Teaching Adults as per the ANSI Standard Z490.1.

Topics covered include:

- Learning Styles
- Motivation
- Needs Analysis
- Training Goals
- Lesson Plans
- Obtaining Feedback
- Verification Methods
- Assessments

Upon successful completion of the Trainer Class, students will be given the resources to create their own Training. They then must develop their lesson plans, presentations, test , etc.

A second session will be required to observe the Trainers To Be presenting their class. Upon successfully presenting the material they can obtain certification as a Trainer for that Course.

## **Consulting Services**

FS Solutions offers Consulting Services in the following areas.

- Regulatory Compliance
- Safety Audits
- Procedural Audits
- Program Review and Development
- Policy Review and Development
- Training Review and Development
- Initial New Procedure Supervision
- Initial New Product Supervision

Pricing is the same as other Training Services.



## **Training Venues**

### **At Your Site**

All FS Solutions courses can be taught at your location for a daily fee (see Pricing).

Site Training requires the following:

- Climate controlled classroom with desk and seating for all students.
- Whiteboard and Presentation Charts with Appropriate Markers.
- PowerPoint Projector and Screen, Speakers and any required Electrical Cords.
- Paper, Pencils, Pens and Paper for Students.
- All required PPE for students performing Hands-On Training.
- Equipment, Accessories and Supplies required for Hands-On Training.

Some or all of the above can be provided at an additional charge by FS Solutions. Prior notice is required.

### **Public Offerings**

FS Solutions and the manufacturer offer scheduled Public Offering training periodically throughout the year in various cities.

Please check the FS Solutions website for upcoming Public Offering training opportunities.

### **FS Solutions Centers**

FS Solutions has the ability to offer many of the courses at the FS Solutions Center closest to you. Please contact your local FS Solutions Center for additional information.

## **FS Solution Center Locations**

### **Alabama**

8584 Borden Avenue, SE  
Leeds, AL 35094  
800.822.8785

### **California**

1510 Hayes Avenue  
Long Beach, CA 90813  
562.436.0250

### **Louisiana**

3111 South Darla Drive  
Gonzales, LA 70737  
225.647.0660

### **North Dakota**

305 Energy Drive  
Williston, ND 58801  
701.572.7421

### **Ohio**

1144 Expressway Drive South  
Toledo, OH 43608  
888.415.7368

### **South Carolina**

116 Meat Plant Road  
Lexington, SC 92073  
803.996.0741

### **Texas**

10001 Porter Road, Suite 200  
LaPorte, TX  
281.674.8668

### **New Jersey**

17 Jules Lane  
New Brunswick, NJ  
732.448.7830

### **Indiana**

9932 Express Drive  
Highland, IN  
219.924.3734

### **Washington**

10816 25th Avenue South  
Lakewood, WA  
253.584.0653

## **Other Training Locations**

### **Illinois**

Vactor Manufacturing  
1621 S. Illinois Street  
Streator, IL 61364  
800-627-3171

### **Texas**

Jetstream of Houston  
5905 Thomas Road  
Houston, TX 77041  
800-231-8192



## FS Solutions On-Site Training/Service Pricing – 2015

### Training & Travel

- Single day training/service ..... \$ 2,000.00
- Two consecutive days of training/service ..... \$ 3,250.00
- Three consecutive days of training/service ..... \$ 4,800.00
- Four consecutive days of training/service..... \$ 6,400.00
- Five consecutive days of training/service..... \$ 7,500.00
- Exclusive Travel Day – Driving, Up To 150 Miles from Trenton, SC..... \$ 250.00
- Exclusive Travel Day – Up to Six Hours ..... \$ 750.00
- Exclusive Travel Day – More Than Six Hours ..... \$ 1,250.00

### Other Charges

- Master Copy of Student Handouts for Client Photocopying ..... N/C
- Student Handouts – Bound (b/w) FS Solutions Provided ..... \$ 10.00 ea
- Student Handouts – Bound (color) FS Solutions Provided..... \$ 25.00 ea
- Embossed CET Stamp on Certificate of Completion ..... N/C

### Expenses

- Company Car Mileage – reimbursement at IRS reimbursement rate
- Parking – cost plus 15%
- Air Travel – cost plus 15%
- Rental Car & Fuel – cost plus 15%
- Lodging – cost plus 15%
- Per Diem – \$90.00/day - Less provided meals at \$30/meal credit (Gluten Free Required)
- Other Incurred Expenses not listed above – cost plus 15%
- Any client provided services will not be charged

### Payment Terms

- Standard terms and conditions
- **Course cancellation, less than 14 calendar days prior to training, will result in an invoice for 25% of the cost of the cancelled training and any expenses incurred (including airfare).**

Effective March 1, 2015 - February 29, 2016

## **TERMS AND CONDITIONS APPLICABLE TO CLASSES OFFERED BY FS SOLUTIONS**

The following terms apply to enrollment in classes offered by FS Solutions. These terms, along with any applicable license agreement and the order acknowledgment to which these terms and conditions are attached, are the complete agreement between us regarding the courses and related education materials we provide and replace any prior oral or written communications between us. Attendance at a class or your use of any education materials constitutes your agreement to abide by these terms and conditions. Occasionally, we have offerings with additional or different terms and conditions. If so, we will provide those terms and conditions to you.

### **Courses and education materials**

FS Solutions has sole discretion to establish and amend its schedule of offerings. We may add or withdraw courses and education materials at any time without notice.

### **Scheduling classes**

We will specify the dates of classes. Unless specified otherwise, all classes will be conducted at FS Solutions locations. We may cancel any scheduled class on short notice. If we cancel a class for which you have prepaid, we will refund the price you paid.

### **Accommodations for students with disabilities**

FS Solutions locations are accessible for persons with disabilities. If reasonable accommodations are required for an individual with a disability, please advise FS Solutions of the accommodations in advance.

### **Prices and payment**

Prices for classes will be those in effect on the date payment is tendered if tendered prior to the commencement of the class and if not will be those in effect on the day the class begins. Prices include the use of required education materials and machines. They do not include taxes or travel and living expenses, which will be the sole responsibility of the students attending classes. Subject to the foregoing concerning payment prior to commencement, FS Solutions reserves the right to increase prices at any time without prior notification.

You agree to pay amounts due, including applicable taxes and any late payment fees, as we specify in the invoice, within 30 days of invoice. Late payments shall accrue interest at an annual rate of eighteen percent (18%), compounded monthly, for each day beyond the due date.

### **Cancellation charges**

You may cancel your class enrollment without charge at any time until fifteen days prior to the scheduled start date. If you cancel within fourteen days of the scheduled start date, you will be charged 25% of the course price as an administrative fee, along with any expenses of FS Solutions in connection with the canceled class, up to the full price of the class. You will be charged the full price of a class if you do not show up for the class.

### **Patents and copyrights**

If a third party claims that the education materials we provide to you infringe that party's patent or copyright, we will defend you against that claim at our expense and pay all costs, damages, and attorney's fees that a court finally awards, provided that you:

1. promptly notify us in writing of the claim; and
2. allow us to control, and cooperate with us in, the defense and any related settlement negotiations.

If such a claim is made or appears likely to be made, you agree to permit us to enable you to continue to use the education materials, or to modify or replace them.

If we determine that none of these alternatives is reasonably available, you agree to return the education materials to us on our written request. We will then give you an appropriate credit for the returned materials.

This is our entire obligation to you regarding any claim of infringement.

We have no obligation regarding any claim based on your modification of education materials.

### **Limitation of liability**

Circumstances may arise where, because of a default on our part or other liability, you are entitled to recover damages from us. In each such instance, except for the payments referred to in our patent and copyright terms described above, we are liable only for the charges for the class that is the subject of the claim.

This limit also applies to any of our subcontractors. It is the maximum for which we are collectively responsible.

### **Items for which we are not liable**

Under no circumstances are we or our subcontractors liable for any of the following:

1. third-party claims against you for losses or damages (except as described above in the section entitled "Patents and Copyrights");
2. loss of, or damage to, your records or data; or
3. special, incidental, or indirect damages or for any economic consequential damages (including lost profits or savings), even if we are informed of their possibility.

### **License**

Any machine readable education materials that we provide to you will be subject to the terms and conditions of a license agreement. We will inform you of the applicable agreement.

### **Warranty**

THERE ARE NO EXPRESS WARRANTIES EXCEPT THOSE CONTAINED HEREIN OR IN ANY APPLICABLE LICENSE AGREEMENT. THERE ARE NO IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. WE MAKE NO WARRANTY AS TO RESULTS TO BE ATTAINED BY ATTENDING OUR CLASSES OR USING OUR EDUCATION MATERIALS.

### **Changes to this agreement**

We may modify these terms and conditions on written notice. The modified terms and conditions will apply to your enrollment or order unless you cancel such enrollment or order prior to the effective date. Otherwise, for a change to be valid, both of us must sign it. Additional or different terms and conditions in any order or communication from you are void.

### **General**

You agree not to copy our copyrighted material without our prior written consent.

You agree not to use recording equipment in our classes without our prior written consent.

You agree not to use our trademarks, trade names, or other designations in any promotion or publication without our prior written consent.

You agree not to assign, or otherwise transfer your rights under this Agreement without our prior written consent. Any attempt to do so is void.

Neither of us is responsible for failure to fulfill any obligations due to causes beyond its control.

Neither of us will bring a legal action (under this Agreement) more than two years after the cause of action arose.

Any terms of this Agreement, which by their nature extend beyond its termination, remain in effect until fulfilled, and apply to respective successors and assignees.

The laws of the State of Illinois govern this Agreement

