Below The Surface

Glenn Underwater Services, Inc. - Innovative Underwater Solutions
INSPECTION - MAINTENANCE - CONSTRUCTION

Volume 1, 2010

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OSHA® Safety Standards Review

The following OSHA Standards are an excerpt from the guidelines for commercial diving safety regulations:

29 CFR 1910.425 Surface-supplied air diving.

1. 29CFR 1910.425(b) Limits.

a. 29CFR 1910.425(b)(1). The maximum depth for surface-supplied air diving is 190 fsw, except that surface-supplied air dives with bottom times of less than 30 minutes may be conducted to a maximum depth of 220 fsw.

b. 29 CFR 1910.425(b)(2). A decompression chamber is required (available within 5 minutes from the dive location) for dives deeper than 100 fsw, or any dive that requires planned decompression.

"DEEP Thoughts"

Editorial by Rick Glenn

January marked my 30th year in the commercial diving industry. As I celebrate this anniversary, all I can think of is "how did time pass so fast." I can say at this milestone in my carreer and my life, I still enjoy my work in the diving industry.

Our goal going forward with our new quarterly newsletter, "Below The Surface", is to simply provide useful information to our clients and friends with regards to the diving industry, our experiences with the work we have performed and introduce new technologies. Hopefully we will broaden some horizons, be able to keep everyone updated on issues regarding "Dive Safety" and add in a little bit of history.

History is another of my passions, so I appologize in advance. I hope you will enjoy the reading, and if you would like for us to add any items or if you have any suggestions, please let us know.

R. L. G.

Rick Glenn, President
Glenn Underwater Services, Inc.

G.U.S. News

New ROV & Trailers

Glenn Underwater Services, Inc. is proud to announce the completion of several custom designed and purpose built ROV Inspection Control Trailers. The new trailers enable our ROV inspection teams to more comfortably and efficiently provide critical ROV services to our clients. With its small footprint and light weight, the Control Trailer can be placed just about anywhere. With this addition, GUS is a more capable and dependable provider of industry critical ROV inspection services. Contact our offices today with questions regarding your needs.

ROV Control Trailer

Excavator Salvage Operation

Lake Norman, North Carolina

The Glenn Underwater Services, Inc. (GUS) team is always ready for a new challenge, but raising a 52,000 pound trackhoe from the bottom of Lake Norman created a unique opportunity. With careful planning and execution, the trackhoe was gently raised from nearly 100 feet without spilling fuel, hydraulic fluid or engine oil into the recreational waters.

Late summer the trackhoe fell off a barge as it traveled across the main channel of the lake. GUS formulated an excavation plan using lift bags and 1 1/2 inch steel cables secured to the front, back and middle of the trackhoe and around the arm to keep it in place.

The main cable was linked together in 20-foot sections and a stabilizing lift bag was inflated at the surface to stretch the cable. A diver attached a second deflated bag to the 20-foot cable section closest to the trackhoe and inflated it from a manifold on the surface. This raised the excavator 20 feet from the bottom of the lake. Once the second bag was inflated, the first bag was deflated and the diver removed it and connected it to the next 20-foot link in the cable. This continued until the excavator softly broke surface.

Crucial to the success of the project was raising the trackhoe slowly to avoid popping it to the surface like a cork and risking diver injury, a fuel spill or flipping the trackhoe only to have it resettle on the lake floor. GUS coordinated with an environmental cleanup company to encircle the work area with a boom in case a spill occurred. Mecklenburg County Land Use and Environmental Services environmental supervisor, David Caldwell, attended the operation, and he credited Rick and his dive team with completing the project safely and successfully.

Strong winds and rain moved in soon after the trackhoe was raised, and the GUS salvage crew towed the excavator close to shore and let it rest on its tracks on the lake bottom overnight. The next morning the crew towed the trackhoe about 5 miles to the owner's property. Providing customized service with leading-edge technology in every job challenge is the goal of Glenn Underwater Services, Inc.

Barge with dive chamber & equipment setup.

Dive & air bag inflation monitoring station.

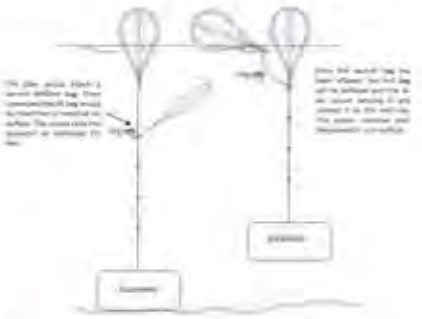


Diagram of air bag inflation process.

Excavator being towed out of water.

Mini ROV Has Big Impact

This is an excerpt from the article written for and published in the Water Power & Dam Construction - April, 2009.

A violent subsurface explosion at a hydro station, the cycling of the wicket and head gates and no idea what caused the event is a hazardous situation too dangerous for divers to investigate. In 2008, Glenn Underwater Services, Inc. was called to perform an emergency underwater inspection in this unknown and extremely dangerous accident.

Richard Glenn, president of Glenn Underwater Services, Inc. (GUS), was able to accept the job knowing none of his divers would be at risk while assessing the situation. How was this done? GUS deployed its LBV200L mini ROV at the accident site prior to any diver entering the water. The deployment cycle alone saved a full day that otherwise would have been spent mobilizing the team and setting up a dive station. The LBV200L pilot began a lengthy and highly technical inspection and soon discovered a gate collapse resulting from guide failure.

Glenn Underwater Services, Inc. has been using ROVs for many years and is very familiar with the benefits of their application. More advanced camera systems, navigation and imaging sonars, position systems and flight controls have enabled the company to expand its use of ROVs to a wider range of applications.

Increasing job safety by limiting the exposure of divers to unknown situations and gathering detailed and reliable information to formulate dive safety plans are the main goals of our ROV program. In this economic climate, it's important to note our cost savings by incorporating the LBV200L means we can pass our savings on to clients. Safety and efficiency…real benefits the ROV LBV200L provides the clients of Glenn Underwater Services, Inc.

The LBV200L ROV

Image of the damage taken by the ROV

The gate did substantial damage to the concrete base of the scroll case

Technology Corner
Hi - Tech Concrete Patching Materials

Glenn Underwater Services, Inc. recently inspected, repaired and rehabilitated a gate control structure and concrete spillway at a reservoir dam located along the Gulf Coast. This work required extensive above and below water work. Our team determined the spillway had experienced severe spalling, separation and rebar corrosion at the horizontal and vertical joints. The repair material selected by GUS to rehabilitate these areas had to meet these minimum requirements:

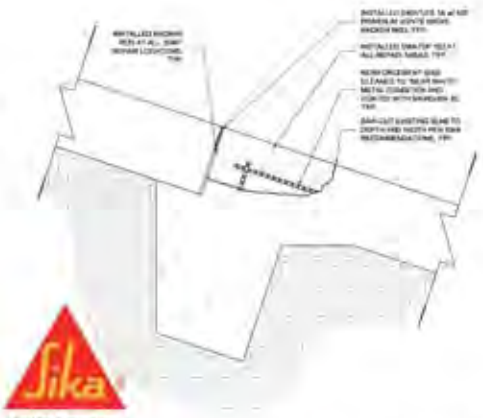
1- Thermal expansion/properties had to be well-matched to the substrate.

2- Bonding to the substrate had to be reliable and consistent.

3- The slump had to allow for placement on steep slopes.

4- The material had to be abrasion and erosion resistant.

For the repair, GUS selected Sika's Sika Top 122 Plus. This product provided increased bonding capability and the abrasion resistance required for this project. Test patches were applied and evaluated for a period of time before the actual repairs were conducted. The material performed well and additional details can be provided upon request.



Surface Preparation:

The concrete surfaces in the repair areas were clean, sound, and free of contaminants. All loose and deteriorated concrete was removed by mechanical means. GUS mechanically prepared the concrete substrate to obtain a surface profile of + / - 1/16" (CSP 5 or greater as per ICRI Guidelines) with new exposed aggregate surface.

The perimeter of the repair area was sawcut at 90° to a depth of between 1.5 to 2 inches. The purpose of the saw cuts is to provide a retaining boundary against which the repair material can be compacted and consolidated. This prevents feathering of the repair material which is more prone to shrinkage, delamination and bond failure. The exact opening of the repair was not sawcut, it is more effective to form straight lines when possible.

Damp burlap was applied over repair area after application. The burlap was maintained in a wet condition for a period of 14 days.

MATERIAL SPECIFICATIONS

SIKATOP 122

Two-component, polymer-modified, cementitious, trowelgrade mortar. 28 day compressive strength of 7,000 psi.

SIKAFLEX 1A

One part polyurethane, elastomeric sealant / adhesive. Moisture-cured, high performance sealant for 1/2" maximum depth

Technology Corner Cont.

UNITEC Pneumatic Concrete Chain Saw CS536163

Glenn Underwater Services, Inc. has purchased Unitec's Pneumatic concrete chain saw (CS 536163) to replace older versions in our inventory. The saw can cut to depths of approximately 15" in a single pass, and we found the tool to be very durable. The chains are expensive, as with all diamond concrete chains. On our last project where large river aggregate was utilized in the construction of the dam, we went through two chains a day. It is important to filter the air and maintain pressure between 90 & 100psi. Sustained elevated pressure will cause the motor to wear and quickly reduce the life expectancy. We added pressure regulators to maintain proper air flow to the tool. Of course, underwater the pressure has to be increased to overcome bottom pressure.

Unitec Photo


Actual GUS Field Photo

Features

- Safety operating trigger prevents accidental starting.
- Now with AirFORCE F4™ Diamond chain – optimized for use with pneumatic saw
- Built-in Wallwalker" provides leverage advantage to make cutting easier.
- Modular design for easy service.
- Tough industrial finish - on die-cast aluminum body.

On This Date - Winter 1926

The Conowingo Dam starts construction!

On January 23, 1925, Philadelphia Electric Company awarded the construction contract for the Conowingo dam to Stone Webster of Boston, who did the design. Construction of the dam started in 1926. The construction was carried out by Arundel Corporation of Maryland. Abandoned railroad tracks for transporting heavy equipment to the dam site can be seen along the western shore of the river below the dam. When completed in 1928, it was the second largest hydroelectric project by power output in the United States, behind only Niagara Falls. The dam was originally built by the Philadelphia Electric Company.

Through subsidiaries and mergers, the dam is now operated by the Susquehanna Electric Company, part of Exelon Power Corporation. Eleven turbine sites were constructed but only seven turbines were initially installed, driving generators each rated for 36 megawatts. A turbine house, on the southwestern end of the dam, encloses these seven units. One additional "house" unit provides 25 Hz power for the dam's electric railroad system.

In 1978, four higher capacity turbines were added. Each drives a 65 megawatt generator, increasing the dam's electrical output capacity from 252 to 548 megawatts. The four newer turbines are in the open air section at the northeast end of the power house. The generators produce power at 13,800 volts. This is stepped up to 220,000 volts for transmission, primarily to the Philadelphia area. The dam currently contributes an average of 1.6 billion kilowatt hours annually to the electric grid.


Conowingo Dam - 1927


Conowingo Dam - Present Day

G.U.S. Project Updates

ROV Survey Of Penstocks & Manifold

Glenn Underwater Services, Inc., by utilizing its LBV200 Remotely Operated Vehicle, performed a detailed inspection of the steel lined sections of an intake tunnel, manifold and five penstocks at a hydroelectric facility located on the East Coast of the United States. The ROV was cabled into position and lowered into the center of the surge tank basin (see photo) and lowered into the steel-lined portion of the intake tunnel. This was accomplished without the aid of an overhead crane or personnel positioned at the point of entry.

The location and position of the ROV during the inspection was monitored topside by utilizing an onboard precise underwater sonar and navigation system. Our sonar has a resolution of up to 80 meters (262ft) and a full 360 degree scan which creates an image surrounding the ROV. The sonar allows the operator and topside inspection personnel to know exactly where the vehicle is within a structure. This capability facilitates returning the ROV to specific areas of interest for future inspections.

Surge Tank Tower - ROV Insertion

3D Model Image of Penstock Inspection

Remote Trailer - ROV Insertion

Confined Space Entry - Safety First by Joe Virsack (GUS Safety Consultant)

We may not always think about our work areas as "dangerous" or "confined spaces" but they can be.

What is a Confined Space?

OSHA 1910.146(a) (23), General Industry Standard defines Confined Space Entry as:

1. Is large enough and so configured that an employee can bodily enter and perform assigned work.
2. Has limited or restricted means for entry or exit, (some examples are tanks, vessels, silos, storage bins, hoppers, vaults, pits and diked areas);
3. Is not designed for continuous human occupancy, and has one or more of the following characteristics:

OSHA goes on to say a Permit Required Confined Space:

a. Contains or has a known potential to contain a hazardous atmosphere;
b. Contains a material with the potential for engulfment of the entrant;
c. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or a floor which slopes downward and tapers to a smaller cross-section;
d. Contains any other recognized safety or health hazard."

Joe Virsack, MBA, CSP

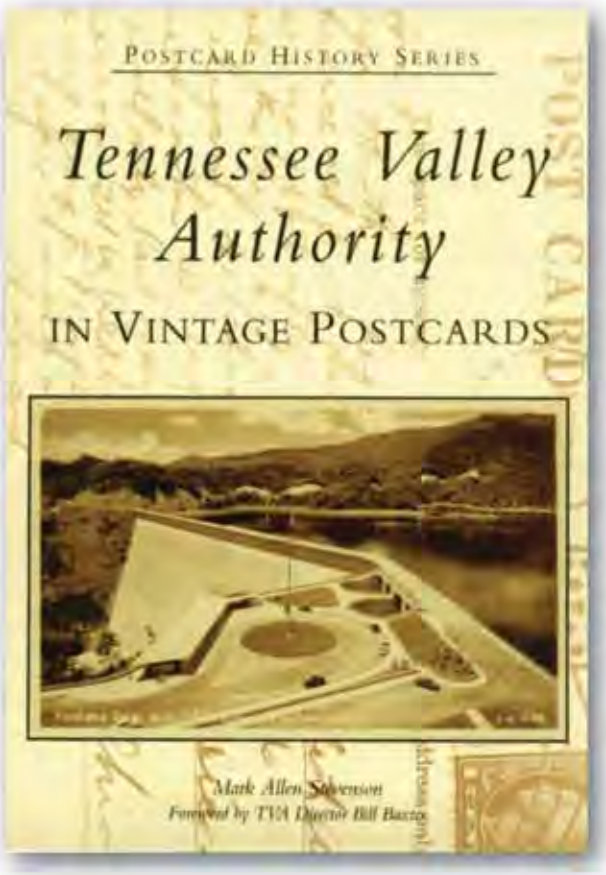
OSHA 1926.21, Construction Standard defines it as, "any space having a limited means of egress, which is subject to the accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere. Confined or enclosed spaces include, but are not limited to, storage tanks, process vessels, bins, boilers, ventilation or exhaust ducts, sewers, underground utility vaults, tunnels, pipelines, and open top spaces more than 4 feet deep such as pits, tubs, vaults, and vessels." OSHA 1926 is the construction industry standard.

Consider the work space may have little or no room, hardly any breathable air and hard work on your part... this can place high demands on your system. To avoid problems, use a Permit system prior to and during entry. Test the air! Train all employees to understand their role and qualify persons to act as an Attendant, Entrant and Supervisor.

Hazards of entry may include poor air quality, insufficient exchange of air, lack of oxygen or chemical substances. Lastly, have a plan for rescuing entrants. Practice entries, use of equipment and rescue techniques to insure compliance. Insure everyone that goes into these spaces comes back again safely.

Joe Virsack is owner of JBV, INC. a management consulting firm providing safety & health services to all industries. Contact info: *jbvirsack@aol.com* - 423-718-5907

Showcase Center



Author Bio: In this contribution to the region's history, author Mark Allen Stevenson, a professional engineer in Chattanooga, reviews the development of TVA's hydroelectric projects as the area emerged from the Depression and prepared for war. Tennessee Valley Authority celebrates the achievements of this remarkable agency, now approaching its 75th anniversary.

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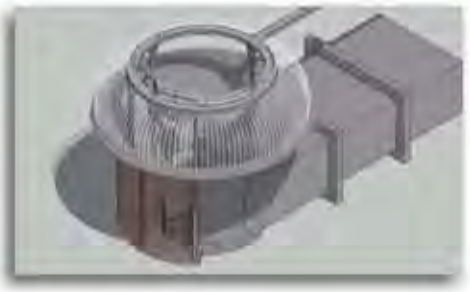
G.U.S. New Services Available

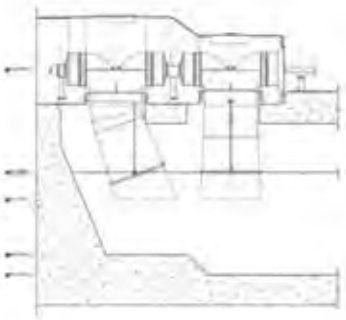
3D Modeling

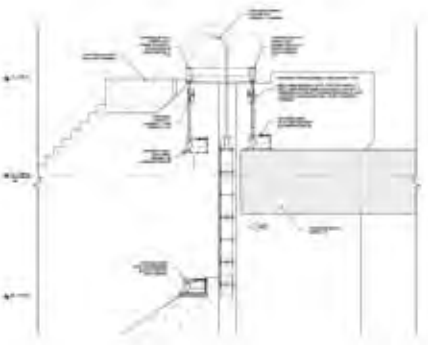
GUS now has the ability to produce 3D models of existing conditions and repairs for maintenance & archival documentation records.



CADD Design

GUS is now producing CADD files in .dwg format for construction and inspection documentation for clients. Hard copies are also supplied.





G.U.S. New Staff

Glenn Underwater Services, Inc. is proud to announce the following additions to it's staff:

Patricia Dunn
Accounting Manager

Trish is the accounting manager for GUS. Her duties include all aspects of accounting including A/P and purchase order creation, with heavy detail in job costing. She received her degree in Business Admin. from Montreat College and an Assoc. Degree in Accounting from Central Piedmont Community College. Trish has worked in both public and private industry accounting for approximately 20 years.

Stuart Nance
Executive Assistant

Stuart Nance is the executive assistant for GUS. Her duties include assisting the management team, purchasing and customer service. She received her degree in Journalism from the University of North Carolina-Chapel Hill.

Benjamin Cohey
Director of Design Services

Ben is a draftsman and graphic designer for GUS. His responsibilities include documenting existing field conditions, recording surveys and repair work in CADD. Prior to his position with GUS, Ben was a designer at Gresham Smith & Partners Architects. He received a degree from Anne Arudel Community College and attended UNC-Charlotte.

Kurt Ward
Director of Field Operations

Kurt is the Operation manager for GUS. He has 27 years experience in underwater construction. Kurt's roles with GUS include field project management, equipment & supplies oversight and field point of contact.

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"We provide specialized services,
improved methods and extensive experience
in underwater inspection, maintenance and construction"

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