

SPARKS & REMARKS

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TTI-FSS Bullet Tanks Hit the Bull's Eye



TTI-FSS was recently awarded a contract to build two ASME bullet tanks (pressure vessels) for an important oil and gas industry customer. The tanks, designed for storage of LPG, were constructed out of 1 inch thick steel plates rolled to 11 feet 0 inch diameter rings. Using various welding techniques, the edges of the rings were connected linearly to create a single pressure vessel 135 feet long when capped at each end. Each tank weighs 188,000 pounds (94 tons) with a capacity of 90,000 gallons. Custom designed manway ports and access nozzles were cut into the shell and then mounted onto the exterior of tank. Given the overall size and distributed weight of the bullet tank, steel saddles were designed to securely hold the tank when seated horizontally on the ground. Also, special attention was given to the design and location of lift lugs required to raise the tank horizontally for placement

in the fabrication shop, on a shipping platform and/or delivered to the owner's storage site. A customized critical lift plan was developed by a team of project stakeholders including representatives of the owner, crane company, site installation contractor, transportation company and TTI-FSS' project management and operations leadership.

TTI-FSS performed scores of X-ray tests on welded joints during fabrication. However, the most critical testing was yet to come. Both pressure vessels were lifted and placed in designated test locations and then filled with water (a combined total of 180,000 gallons weighing of 1,996,000 pounds, 998 tons). Both bullet tanks were ready for hydrotesting once sensitive pressure monitoring equipment was installed and the internal pressure was increased to 425 psi. After sustained at this extreme pressure for more than 4 hours, both tanks were monitored for pressure variance and both passed testing parameters.

The final project challenges were painting and transportation to our customer's storage facility site at the Port of Tampa. All quality inspections were completed as the customer prepared for delivery of the massive cargo to their storage site. For safe, strong and confident mounting

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Success for Our Customers, Our Employees & Our Company

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LETTER FROM THE CEO



We have a large project ongoing in Panama where our leadership and tank teams have excelled on safety, quality and delivery schedule.

In St. Eustatius, we have reached substantial completion on a large, challenging project in a difficult environment. Yet again, we are advancing our project safely with quality workmanship and remaining on-schedule despite a devastating hurricane last season.

In St. Croix, we have successfully delivered a multitude of projects over a few years despite several hurricanes. Adhering to our company values, these customer projects are always managed with safety and quality as the top priorities.

Whether it is in the Bahamas and other important project sites in the Caribbean, or in the United States, OUR PEOPLE have continuously achieved the same positive safety and quality results for our customers.

Summer is here and it's the time of year we typically attempt to spend time outdoors socializing with others. As our teams work together, I want to stress that the true value of our company is "OUR PEOPLE."

During the past quarter, I have had the opportunity to travel to several jobsites as well as a few potential project sites. This travel included Panama, St. Eustatius, St. Croix, Texas, and Morocco. Of course, during this time I also spent a good amount of time in our Tampa shops. Wherever I am located while working, I'm clearly reminded that our strength is OUR PEOPLE. Here are a few examples:

In our Tampa fabrication shops, I have seen individuals stepping forward, advancing themselves, and achieving new technical certificates. That commitment enhances our professional approach to our work product. And throughout the company, teams are finding ways to work together more efficiently moving our safety record forward with continuous improvements across all areas for our business. The common thread in this success is OUR PEOPLE and their continuous improvement teamwork.

Work Smart and Stay Safe,
David Hale
President/CEO TTI-FSS

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TTI-FSS Increases Visibility and Markets at Industry Events

National Institute for Storage Tank Management
September 12 - 13, 2018 • Moody Gardens Hotel, Galveston, TX

American Petroleum Institute (API) Tanks
October 15 - 18, 2018 • Hyatt Regency, Austin, TX

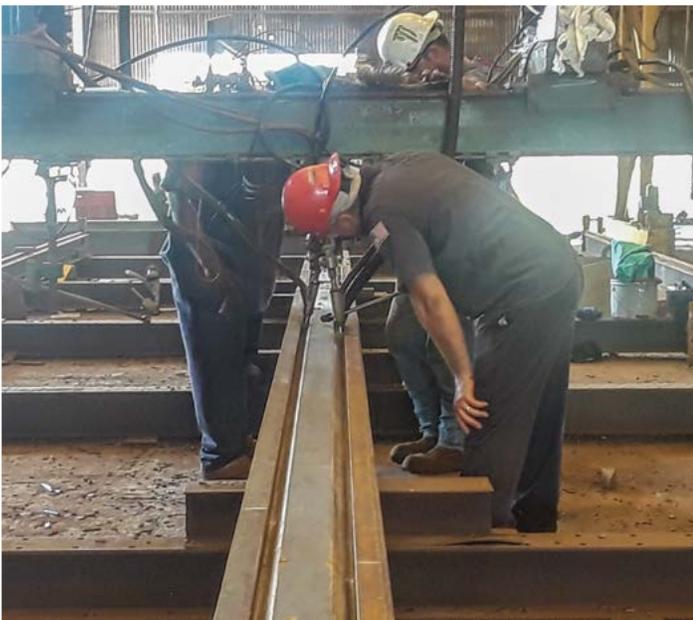
Heavy Movable Structures (HMS) - Booth No. 101
October 23 - 25, 2018 • Renaissance at Sea World, Orlando, FL

WORKING HARDER TO WORK SMARTER



by Jason Chattin

In our industry, workplace efficiency is a key element for business success. Working smarter and planning ahead are essential variables in the formula for efficiency. In welding we look at things like joint design, equipment, manpower, capabilities of manpower, process and more. The wrong choice means the difference between a successful job or not.



A perfect example of this arose recently in the planning phases of an important project. We had to make a quick choice on joint prep for some long, deep partial penetration welds. We just experienced some long groove welds on another job that really required a lot of time and materials when we were forced to run the prequalified bevel prep of 60°. Given a little upfront time on this new job, we decided to run a non-standard joint qualification test to reduce the bevel angle if we felt it would be worth the time and money of qualifying the joint.



With some simple math and a few equations for calculating weld weight, we crunched the numbers on labor and consumable cost between the two bevels. Although common sense says the smaller bevel costs less to weld as long as quality isn't sacrificed, the cost difference was substantially more than expected. Taking into account only wire, flux and labor, the ballpark cost of the reduced 45° bevel came in at 42% below the cost of the planned 60° bevel for the 8 columns. That's a significant savings while only studying a handful of variables! Now, this cost savings only remains true as long as quality is equal when comparing both bevels. However, given the workmanship quality produced by our welding team, this shouldn't be an issue.

In summary, taking time to work smart and safe, to explore options and to define the most efficient and safest choice of processes and procedures before starting a job delivers world class products to our clients and pays off for our company.

EHS: A KEY ROLE FOR TTI-FSS INTERNATIONAL CREWS



TTI-FSS Crew at El Salvador worksite, prior to starting daily safety briefing. From January to May 2018, TTI-FSS worked 42,758 total hours without a recordable incident.

One of the biggest accomplishments for TTI-FSS is its remarkable record of successful safety improvements through the years in the global tank installation and piping industry. TTI-FSS' international crews are mainly comprised of Central American, Andean and Caribbean professionals, many of whom have worked more than 10 years with the company.

Last year, TTI-FSS international crews recorded 946,562 manhours of work without a recordable incident. This impressive safety performance was achieved while completing projects on-time and on-budget. These crews met TTI-FSS stringent safety standards as well as customer-specific safety standards enforced on client jobsites. It is important to recognize that our customers expect the same safety performance from our subcontractors, too. And, we are very proud to report that TTI-FSS' safety performance of zero recordable incidents continued through the first quarter of 2018!

Our customers specifically recognized TTI-FSS for the following achievements on current projects:



TTI-FSS Crew at St. Eustatius, after finishing live system test and customer recognition.

- TTI-FSS is working on several projects on the island of St. Eustatius for an international company. One of the projects, a collaboration with the customer and its fire protection consulting companies, produced a standalone foam and sprinkler firefighting system designed to safeguard storage of approximately 1.1 MM barrels of gasoline and fuel oil. A recent fire system live test and audit successfully concluded the 3-year, 105,000 man-hours project was accomplished with zero recordable incidents. Our customer and the island's Ministry Inspectors recognized TTI-FSS for a job well-done.



TTI-FSS Crew at a Panama project, attending an on-site safety training session.

- A large international project with a very tight schedule is developing in Panama. To date, the project is ahead of schedule. From January to May of this year, 93,150 total hours have been worked without a recordable incident. TTI-FSS believes the primary reason for this schedule and safety performance is the crew's tank

(Continued)

building experience. They recognize doing their work safely eliminates lost time on the project. Our customer is very pleased with TTI-FSS' safety performance and offered the following comments: "TTI-FSS' work has been characterized of one with continuous improvement. TTI-FSS has highly qualified personnel for the different specialties of the project that continuously focus on safety, showing they want to maintain their clean, zero incidents statistic."

- An international oil company awarded TTI-FSS a contract to build storage tanks for petroleum products at one of its terminals in El Salvador, Central America. Stringent safety standards are followed in these facilities. Our customer uses an Environmental Health Safety

contractor management process and all their contractors abide by these important rules and regulations. Recently, TTI-FSS was congratulated after an EHS audit showed us meeting or exceeding established categories. In fact, an auditor commented on TTI-FSS' results, saying: "I have not often seen the results obtained by TTI-FSS while working at one of our Company sites for such a short period of time and implementing very specific and demanding standards, not even by U.S. contractors."

- Similar EHS performance is produced by TTI-FSS crews who worked the first half of 2018 at other international locations such as the Bahamas (several islands), Grand Cayman, Mexico, Honduras, St. Croix, St. Lucia, St. Kitts and Guyana.

TTI-FSS Bullet Tanks Hit the Bull's Eye

(Continued from cover)

onto a specialized trailer designed for the heavy haul, TTI-FSS prepared and strapped down the load three days in advance of shipping. Transportation of each tank required a tractor trailer with special equipment, including a rear steer dolly, totaling over 200 feet long when loaded with the tank. The delivery route required special service

support to manage intersections and over-the-road local traffic. Delivering the LPG bullet tanks safely required a scheduled 120-minute trip along the 10-mile route to the customer's storage site. All was accomplished efficiently and safely.



Two 135 foot, 90,000-gallon bullet tanks delivered to client.

SAFETY MESSAGE: HEAT STRESS

Summer days are hot so we need to take the necessary precautions to keep our body temperature as cool as possible. The term heat stress is used to describe a number of heat-related illnesses that occur when the body is not able to maintain a normal temperature. Heat-related disorders include heat stroke, heat exhaustion, heat cramps, and heat rashes. Heat stress can occur in both indoor and outdoor work settings. Indoor operations involving high ambient temperatures, radiant heat sources, heavy lifting and other strenuous physical activities, and direct physical contact with hot objects increase the potential for heat stress. Outdoor work during the hot summer months, especially activities that require workers to wear semipermeable or impermeable protective clothing also increases the likelihood of heat stress. Individuals vary in their susceptibility to heat stress. Environmental factors that may increase the risk of experiencing heat stress include:

- High temperatures and humidity
- Limited airflow or air movement
- Exposure to indoor sources of heat (ovens, furnaces)
- Direct sunlight
- Heavy workload
- Heavy clothing

Personal factors that may contribute to an individual experiencing heat stress include:

- Level of physical fitness
- Opportunity to acclimate to conditions
- Age
- Dehydration
- Obesity
- Alcohol or drug use
- Infection or illness
- Sunburn
- Certain medications
- Pregnancy
- Previous heat-related illness
- Chronic disease

Key Definitions:

- **Acclimatization:** Exposing the employee to the hot environment for progressively longer periods to allow the body to adapt.
- **Fluid replacement:** Providing cool water to employees and encouraging them to drink small amounts frequently.
- **Engineering controls:** Reducing or eliminating specific job hazards through the use of or substitution of machinery or equipment. (e.g., ventilation, air cooling, fans, shielding, and insulation).
- **Administrative controls:** Reducing specific job hazards through changes in work procedures (e.g., written safety policies, schedule changes, training, and supervision).

- **Convection:** The exchange between the skin surface and the surrounding air.
- **Conduction:** The heat exchange between the heat and a surface.

Summary of Requirements

Although OSHA does not have a standard that specifically addresses employee exposures to extreme heat, the agency does encourage employers to take steps to prevent heat-related illnesses. OSHA inspectors do conduct heat inspections and do issue general duty clause citations when heat hazards are present. Steps employers should take when employees are exposed to heat include:

- Train workers to recognize the signs of heat stress in themselves and their coworkers and what to do in an emergency:
 - o Heat stroke. Heat stroke is a life-threatening condition that occurs when the body is no longer able to regulate temperature through sweating. Symptoms include confusion, loss of consciousness, convulsions, hot, dry skin, and extremely high body temperature. First aid includes calling 911, moving the affected worker to a cool, dry area, and aggressive attempts to lower body temperature through the removal of outer clothing and wetting the skin. The worker needs immediate medical attention. Do not leave the worker unattended.
 - o Heat exhaustion. This condition requires prompt first-aid treatment to prevent it from becoming more serious. Symptoms include clammy skin, nausea, headache, dizziness, weakness, thirst, muscle cramps, and fainting. First aid treatment includes moving the employee to a cooler area, removing outer clothing, and giving cool fluids to drink.
 - o Heat cramps. Heat cramps are painful muscle cramps that occur after sweating and inadequate fluid intake. Symptoms are involuntary muscle spasms and excessive sweating. First aid includes moving the employee to a cool area and providing fluids to drink, especially electrolyte-replacing liquids such as sports drinks. The affected employee should gently stretch the cramped muscle(s).
 - o Heat fatigue. Heat fatigue occurs when workers have had a chance to adapt to the hot working environment. Symptoms include trouble concentrating and working. First aid involves moving the worker to a cooler area and rest.
 - o Heat rash. Heat rash, also known as prickly heat, appears as itchy red bumps on the skin. First aid includes rinsing the affected area with cool water and thoroughly drying the skin.

TTI-FSS TEAM TALK

SAFETY STARS

PORT SAFETY STAR – WILLIAM MORGAN FITTER HELPER

William was working in Port North during a cold spell and noticed a diesel gas heater was too close to the gas lines. His observation avoided a possible fire hazard.



QUARTERLY SAFETY STAR CHRIS BERRY EQUIPMENT OPERATOR

At the Adamo Facility Chris used his experience and knowledge to lead the crew setting up custom girders for transport. He assured the task was completed safely and incident free.



YANDE ALFRED

Yande Alfred passed the OSHA 30 and is our site Safety Manager in St. Lucia.



THOMAS JASPER

Thomas Jasper, QC tech, has completed his MT levels I and II.



KEN BARBER

Ken Barber, Corporate Coatings Manager, passed NACE International Institute Coating Inspector Level I.



ROBERT HUDSON

Robert Hudson passed his UT level II class.



(Continued on next page.)

TTI-FSS TEAM TALK

IVAYLO HRISTOV

Certified Welding Inspector and QC technician, Ivaylo Hristov passed UT levels I and II exams.



JOE EUTERMARK

Joe Eutermark completed his week-long Certified Welding Inspector class.



TOM PANKS

Tom Panks completed and passed his RT levels I and II and MT levels I and II exams. He has completed his practical hours as well and is now a Certified Radiographic and Magnetic Particle Inspector.



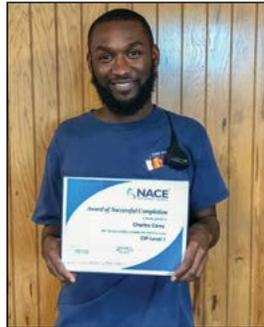
MIKE O'TOOLE

Mike O'Toole recently earned an Overhead Crane "Train the Trainer" Certificate.



CHARLES CAREY

QC Technician, Charles Carey, completed the week-long course in NACE CIP Level I Inspection.



ACCOLADES



Al Schiff (sitting) with his family at the award reception.

Al Schiff received the Lifetime Achievement Award from the University of South Florida Engineering School. Al is a member of our Senior Board of Advisors.



Gordon Gillette - former CEO of Tampa Electric Company (TECO) will be joining our Board of Advisors effective 7/1/2018.