PROTECTING A STORAGE TERMINAL'S MOST VALUABLE ASSET

Protecting the safety of workers as they carry out vital tank cleaning for inspection, maintenance and repair projects is of paramount importance for storage facilities, refineries and operators.

Previously, when conducting aboveground storage tank cleaning, inspection and repairs, workers could only rely on antiquated wooden cribbing stacks, which could significantly compromise their safety.

David Bush, the sole inventor and patent holder of the Delta P Technology was called upon to lead and perform IDLH confined space rescue missions in aboveground storage tanks for the past 15 years.

In an interview with *Tank Storage Magazine*, he says: 'The rescue missions that involved collapsed floating roofs were all recoveries. There were too many bodies and when one man was cut in half by a collapsing roof, I decided that enough was enough.'

'In this safety first driven industry why do we continue to use such a cave man style approach, which has killed hundreds of workers? No-one in the world has spent as much time under collapsed roofs and raising them as I have.'

However, a revolution in tank cribbing technology is set to reinvent the industry standard for worker safety by giving workers and operators a greater peace of mind.

The Delta P Technology is based on an equilateral triangle shape. The ASME carbon steel coated structure – the Delta P Cribbing Tower can support a static load of 108,000 pounds with a 26,800 pound lateral load. Versabar conducted the certified tests and TEAM carried out the NDT testing of the components after being loaded to max. The engineers predicted the unit would fail at static load of 50,000 pounds and 14,000 lateral load. However, the equilateral triangle surpassed all expectations.

The Delta P Cribbing unit has just 18 pieces and each individual piece weighs no more than 50 pounds. When completely assembled, it weighs less than one wood cribbing stack at 700 pounds. However it can be easily relocated by two workers as one piece and only takes three people five minutes to completely assemble each unit.

More importantly, it offers greater safety assurances thanks to its unique structure. Unlike wooden cribbing, the towers will not come apart during lateral roof movements/rotations or collapse.

The technology has been utilised on a recent tank inspection project at Alon USA Refining's facility in Big Spring, Texas.

The 110 foot diameter tank was taken out of service for its 20 year inspection and six Delta P structures were used.

Joel Leonardi, director of safety at Alon USA Refining, explains: 'Floating roofs have the potential to rotate if they don't have anti rotation. With this lateral rotation the roof ends up rotating and collapsing dropping in height and it can cause the wooden cribbing structure to fall because they have not been built to accept that weight or the lateral load.

'The Delta P would not fall over as the triangular structure makes it almost impossible, even if it is knocked over, it will continue to provide the same protection.'

More importantly it also provides a safe area refuge for workers during roof collapse with a certified test of a 2.1 safety factor – it not only surpasses any current standards or practices, but it greatly exceeds them all.

Leonardi adds: 'We can always replace products and technology but we cannot replace people, they are our biggest asset.'

Patrick Bunning, maintenance planning supervisor at Alon USA Refining, who was involved in the tank project says: 'In the past we would typically use wooden cribbing as it was the only option on the market as far as cribbing is concerned.

'These carbon steel structures are 100 times safer than wooden cribbing and the number of structures we need is reduced as well which saves use time and money.

'Years ago in the industry we didn't even put cribbing structures in when working in a tank.'

'We would get in and work and clean without anything so when the wooden cribbing was introduced it was 100 times safer than having nothing at all.

'That has been the industry standard ever since. This Delta P tower is an unbelievably

David Bush, CEO, Delta P with the tank cribbing tower

simple idea but it works and we think that it is great.'

The Adjustable Delta P's can be adjusted from 3.0 feet to 6.8 feet and coated for longevity and ease of decontamination. The Standard Adjustable Delta P Cribbing Tower is 6.0'- 6.4'-6.8'. Most roofs pin at 7.0', the adjustable range of the 8 inches in 4 inch increments allows compensation for sloping tank floors. The Standard Delta P Cribbing Tower is rated for a working load of 50,000 pounds to a maximum of 75,000 pounds.

Leonardi adds: 'Without a shadow of a doubt we will be using the Delta P structures. We have not only gained time on projects but more importantly the people that are working inside the structure of the tank feel more at ease and confident in the ability of the Delta P Cribbing Tower and it offers them peace of mind which means they can focus more on the job at hand.

'When we have confidence in the tools that we are using to help us do the job we set up people for success.'

David Bush, CEO of Delta P Technology, is an international industry recognised expert in improving training standards, confined space operations, aboveground tank regulations, IDLH confined space rescue and incident command. He serves as a director of the Individual Qualification and Certification Institute of America, which provides the highest recognised level of certifications for Tank Entry Supervisors, Confined Space Rescue Teams and Safety Professionals. He is also the author of the STOP Accidents Safety Program.

The Delta P Cribbing Tower being utilised during a tank inspection at Alon USA Refinery's facility in Big Spring, Texas

He adds: 'I decided this must change. I searched for other technologies around tank cribbing and quite simply nothing existed. 'Be the change you want to see' is a quote that inspired me over the past four years and it took all of my 30 years of experience in developing a solution because there had to be a better way.

'The Delta P Technology is so simple. It saves the environment and it saves lives and that is what is most important.

'This is a win-win solution for everyone. The refineries get there tanks back in service faster than before, there is no damage and no-one gets injured or killed. And that is really what it is all about – I did this to save lives.'

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