

CASE STUDY:

Revolutionizing Safety and Efficiency at Texas Chemical Plant



Discover how TEAM's Rope Access solutions transformed operational standards, overcoming challenges in inspections and maintenance at the largest integrated chemical manufacturing complex in the Western Hemisphere.

Overview

This case study delves into the external inspection requirement for Tower T-4 at a chemical plant in Freeport, Texas. During the initial planning stages, meticulous consideration was given to costs and risks. To optimize both expenditure and safety, the business explored alternative methods of access. Consulting with TEAM's on-site Rope Access expert led to the selection of Rope Access as the ideal solution for this critical task.

The Challenge

The Texas chemical plant faced a multifaceted challenge in maintaining the integrity of its critical infrastructure. The scope of work included:

1. Remove Insulation at Specified Areas

This involved the precise removal of insulating material covering specific parts of the tower. The purpose was to access targeted areas essential for inspection and maintenance. Removing insulation allows for a clear view of the underlying structure, enabling comprehensive assessments.



800.662.8326 TeamInc.com contact@TeamInc.com

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2. Collect Thickness Data

A critical aspect of the project was measuring the thickness of the structural material, such as metal across various sections of the tower. This process provides invaluable data points used to assess structural integrity. Monitoring thickness variations helps in detecting signs of wear, corrosion or erosion, guiding maintenance efforts effectively.

3. Perform Surface Eddy Current Inspection for Cracking

Surface eddy current inspections play a pivotal role in ensuring the structural soundness of the tower. Eddy current testing, a non-destructive method, is employed to identify cracks or defects in conductive materials. By placing a coil carrying an alternating current near the surface of the material, any irregularities causing disruptions in the eddy currents can be detected. This technique provides insights into potential cracks or flaws, enabling targeted repairs and maintenance.

4. Perform CUI Inspection on the Tower

Corrosion Under Insulation (CUI) inspections are fundamental in maintaining the longevity of the tower. CUI occurs when the surface of a metal structure, covered by insulation, experiences corrosion. Detecting and addressing CUI is vital for preserving the structural integrity of the tower. The inspections involve checks beneath the insulating material, identifying any corrosion and enabling proactive measures to prevent further deterioration.

Solution Considerations

The initial challenge faced by the chemical plant was the prospect of relying on conventional methods, primarily scaffolding, for essential inspections and maintenance tasks on the T-4 Tower. This approach presented several critical issues:

Overall Footprint of Scaffolding

Implementing traditional scaffolding methods meant dealing with extensive spatial requirements. Erecting scaffolding structures around the 105' x 21.5' T-4 Tower, covering 6,758 square feet of shell, demanded a significant footprint, occupying substantial space within the plant. This large-scale setup posed logistical challenges, impacting the plant's daily operations and causing disruptions in workflow.

More Exposure to Risk with Higher Man-hours

Scaffolding not only consumed vast space but also necessitated a higher number of man-hours for both construction and subsequent dismantling. The prolonged exposure of workers at elevated heights inherently increased the risk factor, raising concerns about safety and potential on-site accidents.

Lead Time for Scaffolding Construction and Delayed Startup

Additionally, the lead time required for scaffolding construction further exacerbated the situation. Delays in the setup process directly translated to postponed project commencement, hindering planned timelines and potentially affecting overall plant productivity.



These challenges prompted the plant management to seek alternative solutions, leading to the exploration of TEAM's Rope Access services. The initial plans to use extensive scaffolding around the T-4 Tower were reconsidered, leading to a more streamlined and efficient approach that significantly reduced costs and enhanced safety measures.



The Ultimate Solution

TEAM's Rope Access experts analyzed the situation and proposed an innovative approach. By deploying highly skilled technicians equipped with Rope Access techniques, the team could perform insulation removal, visual inspections, ultrasonic thickness inspections and surface eddy current inspections without the need for scaffolding. This groundbreaking solution offered a safer, more efficient and cost-effective alternative.

Phases of the Job

This job was completed in 4 phases:

Phase 1: Rigging & Insulation Removal

Rigging for the operation and precise removal of insulating material.

Phase 2: Data Collection Milestone

An important milestone involving different skills for visual and Non-Destructive Testing (NDE) data collection.

Phase 3: Derigging, Weather Proofing & Disposal

Derigging operations, weatherproofing and responsible disposal of removed insulation material.

Phase 4: Finalizing Reports & Data Submission

Finalization of reports and submission of data to the client.

Results

The implementation of TEAM's Rope Access solutions at the chemical plant led to significant cost savings and operational efficiencies, reshaping industry standards within the plant. Moreover, the success of this project has positioned Tower T-4 as a pioneering example for future applications within the facility.

Cost Savings and Efficiency Improvements

TEAM's innovative approach resulted in substantial cost savings for the project. In a conventional scenario, the job's estimated cost using scaffolding was a staggering \$311,859.22. However, by leveraging Rope Access techniques, TEAM reduced this cost dramatically to \$82,126.44, resulting in a total cost savings of \$229,723.56. This reduction in expenses highlighted the cost-effectiveness of the Rope Access solution, demonstrating its superiority over traditional methods.

Reduction in "P-Life" Hours

The concept of "p-life" hours, representing the time it would take to complete the work through conventional methods, witnessed a remarkable reduction of 3,364 hours. This reduction highlighted the efficiency of the Rope Access techniques, showcasing a significant decrease in both time and resources required for the project's completion.

Nearly \$230,000 Cost Savings

-3,364 "P-Life" Hours

> **-2,788** Man-hours





Reduction in Man-hours

Man-hours were reduced by 2,788, further emphasizing the efficiency gains achieved through TEAM's Rope Access services.

Enhanced Safety Culture and Streamlined Operations

Beyond the quantifiable cost savings and time reductions, TEAM's Rope Access services enhanced the plant's safety culture significantly. By eliminating the need for scaffolding, inherent risks associated with elevated work were mitigated, ensuring a safer environment for the technicians involved. This reduction in potential risks not only safeguarded the workforce but also contributed to the establishment of a robust safety culture within the plant.

Timely Response and Efficient Execution

TEAM's rapid response and seamless execution of Rope Access techniques enabled the project to proceed without the delays typically associated with scaffolding construction. The elimination of lead time for scaffolding setup ensured that the project commenced promptly, adhering to planned timelines and minimizing any disruptions to the plant's operations.



In summary, TEAM's Rope Access services not only delivered substantial cost savings and efficiency improvements but also significantly contributed to the plant's safety culture, setting new benchmarks for future projects within the facility. The reduction in overall costs, coupled with the significant decrease in "p-life" hours and man-hours, underscored the effectiveness of TEAM's innovative approach, positioning Rope Access techniques as the preferred choice for complex industrial projects. Tower T-4 stands as a testament to the success of this transformative methodology, serving as a guiding example for future endeavors within the chemical plant.