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Scaffold lifting rig is safe way to lift, move heavy objects

During a planned petrochemical or refining facility shutdown, safety and timing are key. Unfortunately, moving and lifting heavy components can be a challenge for safety and bog down turnaround timetables as well.

For example, during a recent shutdown at a processing facility, an 800-pound actuator was in a tight spot and couldn't be moved using any of the standard methods. Traditional methods for lifting heavy components include using a facility's overhead trolley crane, a fork truck, or removing a roof module and lifting out the object with a large mobile crane (an extremely expensive option of last resort).

In this instance, the turnaround team also considered welding a temporary steel structure to support a chain pull.

However, a welded structure would need to be dismantled afterward.

A lifting rig consists of standard scaffolding with header I-beams and an underhung trolley I-beam securely clamped to the scaffolding. The additional cross-braces provide lateral stability. Depending on the length, size and configuration of the beams, a standard trolley I-beam can support loads of 1,250-10,000 pounds.

As we all know, however, these weight limits do not begin to cover some of the massive components involved with oil and gas extraction and processing. And for these heavier pipes, valves and vessels, a custom-engineered lifting rig solution is often the answer. By engineering lifting rigs for specific applications, processing facilities have moved gigantic pieces of equipment.

At one processing facility, for example, a failing valve needed to be removed and replaced with a new 33,000-pound ball valve. This involved lifting the valve about 3 feet off the floor and moving it laterally about 7 feet. Because the valve was located outside the work envelope of the overhead trolley crane, the facility's engineers originally thought they would need to remove the roof as well as pipes and other infrastructure blocking access and use a mobile crane to lift the valves. This "solution" would have required an extended shutdown and inherently introduced all the hazards associated with a crane pick, so the facility began to look at engineering a lifting rig to move the valve.

The biggest challenge was figuring out what components required clearance and by how much, as well as if pipes could be moved or relocated. The facility was older and had been modified many times. In addition to these complications, the overhead trolley crane needed to go by the area, so the scaffold structure could not interfere with its travel path.

The rigging had a total height exceeding 90 inches and featured two 10-ton trolleys and two 10-ton chain falls to lift the 73-inch-by-80-inch valve by connecting wire rope to the sets of lifting eyes positioned on each end. To ensure even weight distribution between the two pick points, one of the chain falls terminated in a dynamometer.

Valves are among the more common heavy components that need replacement, but other lifts might include a 35,000-pound heat exchanger. Often a mobile crane would lift out a large component like this, but if some essential processing equipment is blocking the way, the crane would not be able to be centered on the heat exchanger.

In this kind of situation, a lifting rig can be engineered to move the heat exchanger laterally far enough for the crane to make a clean pick. While the lifting rig may look completely different from the one used to move valves, it employs the same elements: scaffold, outriggers, cross-bracing, large I-beams and multiple lift points.

At the end of the day on any industrial site, lifting objects presents inherent safety hazards, including working at height, dropped objects, pinch points and confined spaces. Fortunately, now there is another solution to safely and efficiently meet these challenges: scaffold-based lifting rigs.

For more information on formal lifting rig policies and procedures, download the Lifting Rig Guide at https://brandsafway.com/media/lifting-rigs.