Safer Vessel Cleaning

The asset owner had a requirement to descale settler and reactor vessels. They wanted a step change to reduce the labour-intensive task which required confined space entry and exposure to potential hand arm vibration syndrome.

The Challenge

1. The client had 2 settler & 6 reactor tanks, that due to the process & nature of the material have a recuring scaling issue.
2. Current cleaning routine was to take each vessel offline in turn & use manual labour to jack hammer the scale from the walls. This required the erecting of a substantial scaffolding, long duration confined space entry & management of hand arm vibration exposure, combined with a vast amount of manual handing to remove the scale from the vessel.
3. Although the client's sole driver was to reduce this exposure the proposed method also returned the asset to process in a shorter time frame with comparable costs.

The Solution

1. Altrad offered the solution of using the Woma High pressure pump (HPW) combined with a Magnetic Robotic Crawler (MRC) and separate vacuum recovery with amphitec vacuum tanker.
2. The Woma High pressure pump is a wagon mounted jetting pump which jets up to 15,000psi pressure with a flow of 58 lpm.
3. The MRC is an electrically driven robot with all for wheels driven independently. It has been specifically designed & made for cleaning flat and slightly curved metal surfaces with a varied range of jetting nozzles. The robot itself uses two magnetic blocks to secure it to the surface.
4. The Amphitec vacuum tanker has a 3200 m3 liquid ring pump with up to a 15m3 load capacity.
5. Initial entry using high pressure gun and vacuum equipment was required to clear the floor and prep a 1m patch to allow the MRC to make magnetic contact.

Old Method Summary

- Confined space entry (CSE) to manually dig out material from the base of vessel to allow scaffold to be erect = 2 Days
- (CSE) to Erecting of Scaffold 3 scaffolders and confined space attendant = 2 Days
- (CSE) with jack hammer with 8 operatives on rotation including confined space attendant = 8 days
- (CSE) to strip scaffold = 1 day
- Final (CSE) to remove remaining material = 4 day
- Total working hours based on 8hrs days= 640 hours
- Vessel offline duration = 13 days

Altrad Solution Summary

- (CSE) to prepare the tank with High pressure jetting, hand tools and vacuum extraction team of 4 inclusive of Vacuum unit driver & Confined space attendant = 1 day
- (CSE) to position Mag-Track 2 operatives and confined space attendant = ½ Day
- Operate Mag-Track from hatches and gantry = 2.5 days
- (CSE) to use High pressure jetting, hand tools & vacuum equipment = 1 day
- Total working hours = 96 hours
- Vessel offline duration = 5 days

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