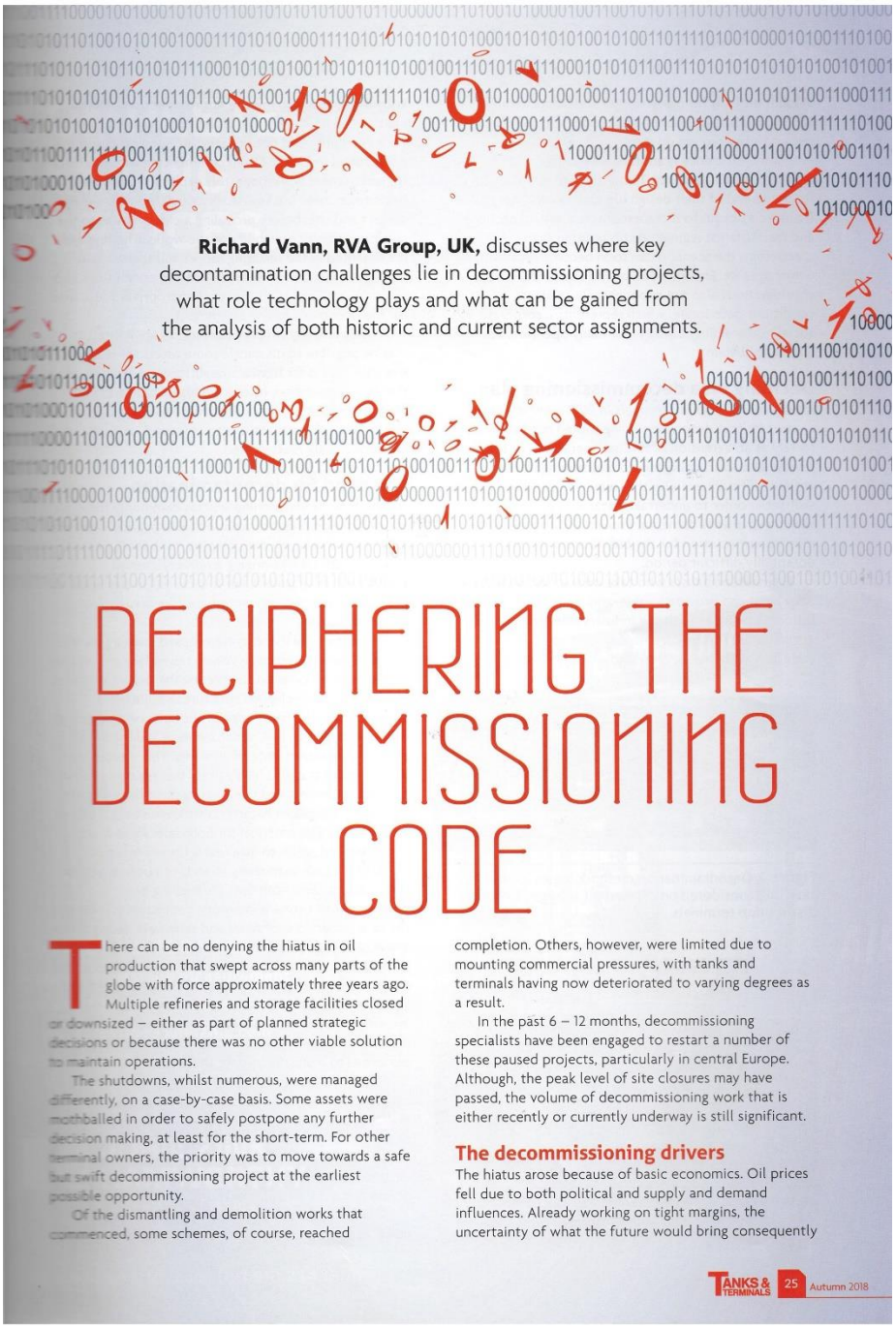
25 **Deciphering the decommissioning code**

Richard Vann, RVA Group, UK, discusses where key decontamination challenges lie in decommissioning projects, what role technology plays and what can be gained from the analysis of both historic and current sector assignments.



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DECIPHERING THE DECOMMISSIONING CODE

There can be no denying the hiatus in oil production that swept across many parts of the globe with force approximately three years ago. Multiple refineries and storage facilities closed or downsized – either as part of planned strategic decisions or because there was no other viable solution to maintain operations.

The shutdowns, whilst numerous, were managed differently, on a case-by-case basis. Some assets were mothballed in order to safely postpone any further decision making, at least for the short-term. For other terminal owners, the priority was to move towards a safe but swift decommissioning project at the earliest possible opportunity.

Of the dismantling and demolition works that commenced, some schemes, of course, reached completion. Others, however, were limited due to mounting commercial pressures, with tanks and terminals having now deteriorated to varying degrees as a result.

In the past 6 – 12 months, decommissioning specialists have been engaged to restart a number of these paused projects, particularly in central Europe. Although, the peak level of site closures may have passed, the volume of decommissioning work that is either recently or currently underway is still significant.

The decommissioning drivers

The hiatus arose because of basic economics. Oil prices fell due to both political and supply and demand influences. Already working on tight margins, the uncertainty of what the future would bring consequently

made it difficult for many oil, gas and petrochemical facilities to sustain economical production, which became a key project driver.

Plant inefficiency is another catalyst for decommissioning activity. Terminals naturally start to reach the end of their design life and, as regulatory frameworks begin to dictate more frequent inspections and maintenance regimes at this point in their chronology, the scenario can soon become financially unmanageable. Environment, health and safety (EHS) considerations also rise exponentially as plant conditions deteriorate, which represents a corporate and social responsibility burden that many operators are unable to sustain.

Deciding on a decommissioning plan

A feature for *Tanks in Terminals* in 2017 drew attention to the fact that decommissioning should not be viewed merely as an extension of normal operations, or the reverse of construction and commissioning.[1] It is an entirely different exercise that requires a comprehensive skill-set in order to undertake hazardous exercises safely with minimal environmental impact, and to ensure the most robust solution for the business during this potentially difficult period.

External specialists who take on such projects on a daily basis can provide a value-adding resource to help support operators with the industry's decommissioning assignments. This involvement should be sought as early as possible, as sector- and discipline-specific knowledge could shape the entire direction of 'what next'.

A feasibility and options study is a logical starting point for all involved. Often commencing with a series of management workshops, this exploratory process helps to uncover the key issues associated with a plant, project and site, before providing a clear view as to the true opportunity or liability of the works. The findings documented in the resulting report will then usually highlight a number of technical, costed conclusions and recommendations as to the most appropriate route map for the decommissioning assignment.

Whilst in many cases opportunities are limited, it may be possible to dismantle some assets for resale, for example. This is far from a straightforward exercise, as the decontamination, laser scanning, match-marking, physical separation, preservation, precise cataloguing and packing of the plant is often required, so that it can be meticulously reassembled.

Figure 1. Decontamination methodologies should be carefully considered on disused oil storage sites and distribution terminals.

Figure 2. Loss of containment is a distinct possibility on long-closed and unmaintained sites.

The need for decontamination

Technical decommissioning articles commonly focus on the demolition phase of a project, with a great degree of attention focusing on the complex methodologies involved with safely bringing a refinery's varied structures to the ground. But it is crucial to pay equal thought to a more imminent phase of works – decontamination.

Given the time that may have lapsed since a tank was first mothballed, decommissioning teams face a significant hurdle when it comes to completing the decontamination of such a partially-cleaned structure. It is almost inevitable that the knowledge of the site's own personnel will have long been lost, which means it is difficult to establish the known state of all assets. This is often the initial priority. It is also highly likely that residual product may still be present and the longer a plant has been left, the greater the risk of hazardous atmospheres or a loss of containment. The potential for both safety and environmental issues to manifest is therefore high.

As is the case with many strands of business activity, technological advancements are fuelling new developments. Drone technology, for instance, is aiding the safe inspections of tanks and terminals, during these initial planning and surveying stages.

As a general rule, the greater the degree of structural dilapidation, the higher the level of risk associated with vessel entry. So, it is far safer to remotely assess the integrity of a terminal that has not been sufficiently maintained for years, via a piloted drone, than it is for personnel to manually inspect the asset.

Structures can quickly become overgrown with moss and other foliage, for example, and the consequences associated with concealed holes in walkways or detached staircases could be catastrophic if these hazards remained unidentified. Drones help to circumnavigate this problem, by determining safe access points and work areas for next-step on-site operatives.

This methodology is also relatively inexpensive; quick, as there is no need to erect any scaffolding or

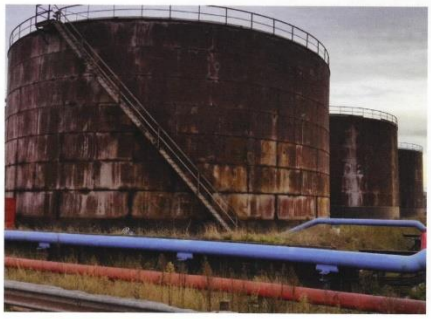

Figure 3. Redundant tanks ready for decommissioning.

other fixed access equipment; and convenient, as it provides a 'birds-eye' picture of structures, however complex, without the need for excessive manpower on the ground. It is far better to lose a dozen drones than it is for a single person to sustain an injury.

If drones are flown over and/or within an even partially operational site, added precautions should be taken. Potentially explosive atmospheres must be clearly zoned, as it is likely that flights will only be permitted within predefined distances. Limitations may also be placed on whether the drone can fly inside a structure, if it could represent a possible source of ignition. To the extent of RVA's knowledge, there are not currently any ATEX-rated drones in the market, but manufacturers will surely move quickly to address this gap.

This technique does not completely negate safety challenges, however. Drone inspections represent just one aspect of a single phase in a potentially lengthy project. But the anticipation of these and other such challenges is key to being able to comprehensively manage them.

Decommissioning in practice

RVA has encountered a number of different decommissioning projects in this sector, each with its own feasibility study outcomes and defined course of action thereafter.

Total engaged RVA to specify the decommissioning works for three road and rail terminal distribution depots in the UK, 15 years ago. Health and safety plans were carefully drafted for all of the depots in Leeds, Langley and Sunderland, with the latter site subsequently sold to another operator. At Leeds and Langley, the sites were shut down and dealt with promptly, with the work carried out soon after and RVA adopting visiting roles to oversee the project.

When Murco's refinery in Milford Haven, UK, closed in 2014, RVA was brought in to specify all work ahead of the site's demolition. The day before the demolition was due to begin, the plant was sold to a company in Pakistan, with RVA later re-engaged to write the alternative dismantling specification. With this project, it was agreed that RVA's involvement would cease when the contractor was engaged, but the piecemeal decommissioning, disassembly and export of the entire refinery is currently underway, with a reported completion date of autumn 2018.

In the case of Petroplus, RVA produced a feasibility and options study for an 8.5 acre site in Teesside, UK – the output of which was then used to formulate a detailed specification for the refinery decommissioning and dismantling works. Petroplus was placed into administration before the project could be executed, but the groundwork has been done for future use.

Fast forward to the present day and two costing studies are currently being undertaken by RVA on terminals in Europe. These will act as strategic management tools that will enable the site owners to make informed decisions about the best course of action for their redundant sites.

Reactive support

There are some instances where decommissioning activities are not pre-planned, of course. In the case of Buncefield, UK – when a catastrophic escape of petroleum caused a mass explosion that overwhelmed 20 storage tanks in 2005 – RVA was appointed by Amec post-trauma, to develop the required specification of work.

The government authorised the use of Aqueous Film Forming Foam (AFFF) to extinguish the fire on the long-burning assets, but the foam itself added to the environmental impact of the disaster.

With buildings bent double, RVA therefore wrote the specification to deal with the safe dismantling of the unstable structures, as well as the cleaning regime required to sanitise the site of the foam, without disturbing the forensic evidence required to piece together the cause of the explosion. A reactive role was maintained over the 12 months that followed, as the distressed tanks and structures were carefully brought to the ground.

A competent supply chain

It is important to note that other heavy industries – beyond the realms of oil, gas and petrochemical refining – are currently experiencing operational challenges too. So, as further site closures are announced globally – necessitating even more decommissioning projects – finding a competent supply chain will become increasingly difficult.

However, there are a refined number of highly-equipped decommissioning consultants, project managers, decontamination specialists, demolition contractors and explosives experts willing to travel across the world to ensure these works are completed to the highest possible standard. All the site owner needs to prioritise is their involvement. T&T

Reference

1. VANN, R. and WALLER, M., 'Out with the old,' *Tanks and Terminals*, (Autumn 2017), pp. 69 – 72.