Petromall

INSIGHTS

JUNE **2017**

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A digital platform to manage decom collaboratively

Petromall

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Making decommissioning easier to manage

Oil and gas decommissioning could be easier to manage if it was easier to get insurance companies to cover different aspects of the risk, if it was easier to transfer tax reliefs from a selling company to a buyer, and if it was easier to put together multiple decommissioning projects together in a 'campaign'. There may be a lot more oil and gas can learn from the nuclear industry. There may be digital tools which can provide a great help.

This issue of Petromall Insights explores these issues in more depth.

We'll look at the potential cost savings from taking a 'campaign' approach with multiple projects; how companies can insure late life asset operations, the decommissioning, and possible post decommissioning pollution costs; and ways to ring-fence the decommissioning funds so they can't be accessed by any other creditors if the small company goes bust.

We'll look at how the British government might be changing tax laws so that the tax relief (from which some of the decommissioning costs can be re-claimed) might be passed from a seller to a buyer.

We'll look at what learning oil and gas decommissioning can make from the nuclear sector, including strategic thinking.

And we'll also look at software tools which can make decommissioning easier to manage, including enabling everyone to collaborate around a single digital design or platform, and ways to improve the scheduling.

David Westwood – adapt a campaign approach

One good way to reduce the costs and improve the manageability of decommissioning is to adapt a campaign approach, basically making a plan to decommission one asset after another, over a period of 5-10 years, Mr Westwood says.

Having a longer campaign means that the same suppliers can be engaged for much longer periods with no down time during the period, so the suppliers can be more productive, the charges paid by oil companies can be less, and the work of validating suppliers only needs to be done once.

Mr Westwood thinks this could be particularly applicable to the Southern North Sea, when there are many offshore platforms which need decommissioning in the same time period.

Mr Westwood is aware of in-depth financial modelling studies, which demonstrated the benefits of following the campaign approach, - in the context of scoping out a campaign for a major North Sea operator 10 years ago. The modelling showed that it could achieve potential cost reductions of 30 per cent. This operator ultimately decided not to follow out the plan because it sold its assets.

There are good financial reason why the UK's Oil and Gas Authority, and government Treasury, could benefit from encouraging the campaign approach, since the government will pay a great deal of the decommissioning costs in the form of tax rebates, Mr Westwood said.

Longer term planning

Another way to reduce decommissioning costs is to plan for it over a much longer period, he said.

So, say 5 years before you expect cessation of production, you can move to an "aggressive planned maintenance regime," only doing maintenance on components which need to be in good condition over the final 5 years, he says. By doing this, you can reduce the overall maintenance costs a great deal.

You can also remove any non-core operational items from the asset five years out, such as a generator you no longer need. This means you will no longer have to maintain it.

New ways of working

The North Sea industry needs to explore new ways of working – including new management models for decommissioning, Mr Westwood says. There has been a big loss of engineering talent from Aberdeen due to the downturn, and oil companies usually want to put their best engineers to work on development projects, not decommissioning.

Large oil companies, with more in-house expertise, are selling their North Sea assets to smaller companies, which have different types of ownership and operational modes.

This is probably a good time to bring in new decommissioning models, such as the idea of passing late life assets onto a specialist decommissioning operator, a model which Mr Westwood has experience of trying to sell to North Sea operators for more than 10 years.

There is also space in the market for new types of financial and risk management products, he says.

"We live in a low cost environment – we've got to try very hard to find new solutions – financial, organisational and technical."

"But whether oil companies are willing to take it onboard is the big question. There's potentially a big prize for both parties. It is a question of trying to trying to find the right operator that's open to this sort of approach."

Background

Mr Westwood's background is from 10 years as a senior vice president Europe and Middle East with URS Corporation, a United States' engineering, design, construction and decommissioning company. During this time, the company was part of consortium which won a decommissioning contract at Sellafield, the UK's nuclear fuel reprocessing site, believed to be "the largest ever contract awarded by the UK government" at the time.

URS subsequently moved towards decommissioning work in the North Sea, bringing in some of its nuclear decommissioning capability, working with high hazard, high consequence projects.

David Westwood

Mr Westwood consequently led a team which had the initial task of decommissioning a set of 64 oil storage "cells", storage tanks held within the submerged concrete legs of an offshore platform. The tanks were 60m high and 20m in diameter, made of 1m thick concrete reinforced with steel bars, and one of the most difficult decommissioning tasks of the entire campaign. At the time it was likely that the designers never considered that they would need to be removed.

Mr Westwood also served on the steering group for the organisation that led to the setting up of Decom North Sea – the trade organisation for the decommissioning supply chain.

Since 2006, Mr Westwood has been looking for new ways to work with oil companies in decommissioning, including establishing a new business model for a decommissioning provider. One of the models explored was to set up a company which could serve as a 'tier 1 service provider' managing the overall decommissioning project, as a "late life asset manager" and duty holder (one of the main companies with responsibility for running the platform, in the eyes of the regulators).

Mr Westwood currently has ownership stakes in 6 companies in the energy field. Another is Kapwell Technologies, an early stage technology development company aiming to develop a better plugging and abandonment system for old oil wells. He has shares in 2 renewables companies and a management consultancy.

Insuring decommissioning projects (and late life operating assets)

Insurance broker K.M. Dastur & Company Limited (KMD) has put together a unique decommissioning insurance package facility in conjunction with Petromall, covering 'late life' operations and the decommissioning process itself.

Insurance broker KMD has put together a bespoke decommissioning insurance facility for E&P companies with assets in the North Sea (and worldwide).

"Part A" of the facility covers the 'late life' of the asset providing the operator with a typical 'package insurance' policy during the latter years of field life production. "Part B", covers the actual decommissioning itself.

The total insurance facility limit available for each operator/asset is up to USD 1,500,000,000 for Part A and USD 1,500,000,000 for Part B.

The insurance product also compliments a 'Part C' environmental product developed by Quatre (see separate article). This Part C product kicks in after the field has been declared decommissioned.

KMD's diverse energy business includes offshore energy infrastructure during its operational life. KMD arranges cover for physical damage, control of well costs following a blow-out, redrill and clean up costs, third party liabilities, loss of production income for operational assets in addition to package programmes for drilling contractors, construction projects and renewable energy.

KMD is an international insurance broker, employing over 1,000 insurance professionals globally located in 27 offices. With a head office in India, the London office is the largest sub-office, where the specialist energy team resides handling this facility.

Steve Giles, Energy Divisional Director at KMD, was interviewed for this article. Mr Giles has been working in energy insurance for 34 years, including 22 years at Marsh, 4 years at Aon Benfield, and working as a senior underwriter for Zurich and then AIG for 6 years. He set up the energy team for KMD in London early 2015.

Late life insurance

Part A of the insurance facility provides 'package' insurance for the 'late life' operations for offshore operating platforms and infrastructure. Primarily it includes property damage, cost of well control, redrill costs, pollution clean-up, legal and contractual third party liabilities and loss of production income and the cover is designed to reflect the reducing cover requirements as end of field life approaches.

At end of field production, when a platform reaches cessation of production (COP), it will be 'warm stacked' – with people still working on the platform and some operations still running.
Prior to decommissioning it goes into 'cold stack', where it is de-manned.
During the warm and cold stack period, the platform may be still insured under its normal 'operational' insurance and this phase may also include the plugging/abandoning programme for the remaining wells.

Decommissioning insurance

Part B of the insurance facility is specially developed for decommissioning, and provides a combination of different necessary and preferred covers. It covers all risks of physical loss or damage to the property, with a nominal value (usually scrap value, or any specific items with a resale value). Key exposure and area of cover is for the risk of dropping part of the platform/module into the sea and/or onto property while lifting it onto a vessel/barge. This risk may impact both 'first party' and 'third party' property and so the facility affords cover for both first and third party 'removal of wreck'.
Cover also includes the risks of transit of the decommissioned assets to shore, following either a heavy lift in one piece, or piece by piece disassembly.

The facility provides for any pollution clean-up costs, including pollution of third party property and there is cover for the Offshore Pollution Liability Agreement (known as 'OPOL') which is mandatory for all UK operators to have until wells are permanently plugged and abandoned.

The facility also offers other areas of cover such as offshore terrorism, 'unexploded weapons of war' and 'heavy weather' standby charges for vessels following a loss.

The insurance facility is modified to suit individual needs. "It is not really possible to create one product which fits all - because each program is different," he said.

It is possible to purchase additional 'limit' for "additional costs of decommissioning". This does not include additional/increased costs resulting from a project being more difficult than anticipated or taking longer – or if the cost was incorrectly calculated, Mr Giles says. It can only cover increased costs due to an event or 'proximate cause' arising from an insured peril.

Companies (operators, decommissioning consultants and contractors) are expected to have the competence to adequately calculate costs in advance – and if they underestimate, that is not considered an "insurable fortuity", Mr Giles says.

Risk judgement and underwriters

As an insurance broker, KMD is an intermediary between the client/buyer (the operator) and the insurance provider (the Underwriters). The broker negotiates with the Underwriters, who then make the decision on whether they will cover the risk, and if so and what terms and premium should be applied.

Insurance underwriters are professionals in assessing risk – and do it all the time – deciding if something is high or low risk,

if they should provide insurance for it, and what premium should be charged, Mr Giles says.

The underwriters who are energy specialists have been insuring operational risk and construction risk for decades.

The risk calculation can be made on a mix of professional judgement and assessment of data, although the data may not be fully available.

"It is a lot harder to assess risk with an offshore platform compared to a refinery," he says. "It is quite commonplace for engineers to visit a refinery and issue an engineering report." Whereas, many operators own and operate offshore assets throughout the globe, meaning it is not possible to survey and engineer every offshore platform.

The underwriters will probably also want to understand the maintenance regime of the operator, the culture of the company, and how the operator manages and looks after assets.

"Underwriters like to meet the operators, and listen to what the operator has to say about how they manage the platform," he says.

Decommissioning in the North Sea is still a relatively new area.

"It is something that underwriters need to learn and understand," he says. "There have been decom projects insured in London - but not the volume required for underwriters to have a good understanding of risk versus premium. That's something that they are looking forward to seeing."

In decommissioning, the underwriters' judgement of the contractors selected is a major factor in their assessment of the overall risk. This is a little different to judging the risk during the operational life of the field, which comes down mainly to the integrity of the operator and the quality and location of the asset, Mr Giles says.

Broader industry

An interesting question is whether the availability of insurance packages like this one will affect the broader industry.

Oil majors may prefer to focus on new territories, rather than mature assets, as a key objective for them is to increase proven reserves, which is usually then reflected in share price. Whereas mature assets in decline will not impact share price in either direction. Many majors are therefore divesting mature assets, which enables them to reduce their reserved decommissioning costs within their annual accounts, which in turn frees up capital. Conversely, these mature assets can be of interest to junior UK start-ups, who can focus on extending production field life.

The oil majors divesting assets will perform due diligence on any company aiming to acquire an asset from them and part of this due diligence (or by way of contract) may include specific insurance requirements. This due diligence is also supplemented by OGA approval.

The main development required for North Sea divestment/acquisition is that it should made easier for an existing operator to sell an asset to another. Insurance can play a role in this, because they (the existing operator) can have comfort in the knowledge that all of the insurable risks are covered by insurance during 'late life' and 'decommissioning'. The overall acquisition process is complex and the "numbers need to work" for both operator and the company making the acquisition, meaning that a host of variables must be considered such as asset value, asset cost (not necessarily the same), late life operational costs, 'late life' revenue/value of remaining recoverable reserves, decommissioning costs, and tax relief.

In summary, the bespoke Decommissioning product offered by KMD and Energy Underwriters enables the 'risks' associated with decommissioning to be managed by insurance, while at the same time providing a vehicle to ring fence decommissioning costs should such costs increase by way of an insurable fortuity.

Quatre – Special purpose trusts and post decommissioning insurance

UK consultant Quatre has created two interesting financial products for the decommissioning industry – a 'trust fund' into which funds can be put for decommissioning purposes (which may only be spent on decommissioning) and insurance for pollution risks which may arise during or after decommissioning. It is all geared around peace of mind to companies selling and buying – and other stakeholders - oil industry assets

UK consultant Quatre has set up two financial products for the decommissioning industry – a 'trust fund' which can look after funds to be spent on decommissioning and ensure that no-one else can access them, and post decommissioning liability insurance.

The products have been developed to make it easier to buy and sell older assets. The sellers are the larger oil companies, who would rather focus on new projects. The buyers might be smaller oil companies who are interested in the difficult task of running the platform down and managing the decommissioning.

The products are designed to provide a way around two problems. Firstly, the rule stating that a selling company may need to pay for decommissioning if the buying company proves unable to. This is explained in more detail below. Secondly, the risk that there could be environmental problems with the asset during and after it is considered decommissioned, which the last owner (or failing that, the company which sold the asset) would then need to pay for.

Quatre is setting up a trust fund product, which would hold funds to be spent on decommissioning in a separate account,

independently administrated, with legal guarantees that the money can only be spent on decommissioning. It is also developing decommissioning pollution liability insurance policies. These products are explained in more detail in this article

Quatre is founded by oil and gas industry veteran Paul Jardine, covering insurance brokerage, investment management, legal, taxation, trust management and E&P operations. Duncan Spencer, a specialist pollution insurance broker and consultant, works together with Quatre, and was interviewed for this article.

The company had developed a similar policy for UK onshore fraccing operations, where there was a need to protect the landowner from any environmental liability due to the fraccing, for example if there was some contamination as a result of it.

Quatre is currently aiming to get the word out about the new projects, talking to a number of clients, and running a number of clients through the process "to demonstrate it works," Mr Spencer says.

Special purpose trust

The Special purpose trust holds the money to pay for decommissioning. It is independently managed, ensuring that the funds can't be claimed by (for example) other creditors in a smaller oil company which goes bust.

The fund is held in Guernsey, and managed by Saffery Champness, an independent "fiduciary service provider," and regulated by the Guernsey government. The company has been offering similar services for 40 years.

The funds can be invested in shares so can actually grow in value the longer it is left there. The investment decisions are made by Saffery Champness.

There is a guarantee that the funds can only be spent on decommissioning the asset. This gives the selling oil company security that any money put aside for decommissioning could not be claimed by any other creditors, even if the buying company goes bust. The funds are no longer an asset of the operator. "Were the operator go to bust, the funds would remain ring-fenced and creditors can't take their slice of it before decommissioning happens," Mr Spencer says.

The funds can be invested (for example in shares), so they can grow in value over time. The investments are made by the organisation running the trust.

One possible issue is if the decommissioning turns out to cost more than expected, although Mr Spencer says that it is possible to get comfortable with this risk. The costs need to be independently verified and agreed with OGA. In the past some projects have turned out to cost more than anticipated, but this should mean that the predictions are becoming more accurate.

The product would provide confidence to government and NGO's that the funds are available for when the works need to be completed.

Why the trust fund is needed

You can skip reading this section if you already have an understanding of the UK decommissioning regulations and market but otherwise a bit of background information might be helpful.

When an oil major wants to sell an asset, under current UK regulations, it is liable to pay for decommission if the company it sells it to is not able to pay.

The government brought in this rule because it did not want the government to be liable (as it would ultimately be, if none of the companies involved were able to pay).

From the government's perspective, you can see the need for such a regulatory provision from the story of the BHS pension fund in the UK. The former owner of the BHS retail chain, Philip Green, sold the chain to another company. The buying company proved unable to keep the retail chain in financial health. As a result it went bankrupt, which meant that all of the BHS pensions of former employees could not be funded by BHS. This meant there was a call on government funds to fill the hole. The government could have made a requirement that any seller of a company with a pension fund attached must guarantee the pensions if the buying company is unable to.

But this creates an obstacle to selling assets. You can see why a company might want to get an older asset off its hands, but the sale looks less interesting when you may still be retaining a liability.

And the government is quite keen that asset sales can happen, because a smaller company might be willing to make more effort to keep the asset running. Or a smaller company might be more comfortable at operating at the narrower financial margins which are available towards the end of an asset's life, while the oil major puts its energy into the big fields and big games.

Currently, the problem is resolved using a mixture of due diligence and legal agreements. A seller makes thorough checks that a company buying the asset has the financial standing and competence to carry out the decommissioning – and a 'letter of credit' needs to be provided by a bank with enough funds in it, stating that

Duncan Spencer, specialist pollution insurance broker and consultant, working with Quatre

the bank is able to provide funds for the decommissioning. (The funds of course are provided by the company which buys the asset).

But this doesn't give the seller complete piece of mind – because even healthy companies go bust, and if the company is bankrupt, there are all kinds of calls on its cash – so no guarantee that the funds for decommissioning would still be available.

Insurance

The pollution insurance aims to cover the risk that there could be an environmental liability during or after the asset is decommissioned.

For example, there could be oil leaking out of a well which is not sealed properly, or there is a decaying in the cement used to cap the well over time. Perhaps the pollution won't be noticed for a while, for example is it stays on the seabed.

There could also be a future change in legislation leading to a requirement to spend more money on assets which were already decommissioned, such as a change in allowed concentration of a pollutant from 5ppm to 1ppm, or substances being considered contaminants which are not known about or worried about today.

Perhaps there has been some environmental damage associated with rig

operations over its decades of operation, which was not known about.

The post decommissioning insurance also covers risks that the decommissioning process wasn't successful and environmental issues start to be discovered after the work was thought to have been finished.

Having the insurance allows people to step away and investors to exit the company, Mr Spencer says.

The policy lasts for 10 years, and is paid for as a one off fee by the owners of the asset after they have decommissioned, so can be included in the decommissioning budget. This is a reasonable time for issues to be realised, Mr Spencer says.

If the platform is owned by an oil major, then the authorities can normally assume that if something goes wrong after the decommissioning, the oil company will have the resources to fix it. But this doesn't apply so much if it as smaller company.

Standard public liability insurance does not usually include pollution cover – as the name indicates, it covers risks to the public (i.e. people). "If no- member of the public of the damaged theoretically there's no liability," Mr Spencer says.

The insurance would come into play at the point that everybody considers that the decommissioning is completed.

UK government considering rule changes on tax relief

The UK government is considering changing the decommissioning tax relief rules, which would enable a seller's tax history to be passed on to a buyer. We asked Philip Reid, associate at CMS Cameron McKenna Nabarro Olswang LLP, what is happening

The UK government is considering changing the rules about tax relief on decommissioning, which may mean that a company selling an offshore asset is able to transfer a portion of its tax history to a company buying it.

If the rule changes are introduced, it will enable the buying company to set some of the costs of decommissioning against the tax paid by the selling company. It should also provide an opportunity for the company buying an asset to be put in the same situation with regards to decommissioning tax relief as the company selling it.

The government made an announcement in its March 2017 spring budget, stating that it will look at the issue, in the period up to the autumn 2017 statement.

No commitment was made, but "we would hope that, if the changes were to be introduced following the autumn statement, we might see something as soon as the Finance Act next year," says Philip Reid, a corporate tax associate at CMS Cameron McKenna Nabarro Olswang, and a specialist in oil and gas tax.

The UK government has published a 'consultation paper' and responses are due by the end of June 2017. There is also a panel of industry members discussing it separately.

Why this is necessary

You can skip reading this section if you already understand tax reliefs for decommissioning, but here is an explanation otherwise.

The tax relief is basically a refund of tax paid on historic profits.

Like all businesses, oil companies pay tax each year as a percentage of their profits. The percentage is set by the government, and changes over time (with various 'tax raids' and incentive schemes changing it along the way).

The tax rate has historically been much higher than the corporation rate tax for non-oil and gas companies, in part because the oil company is selling a national asset (oil in the subsurface).

But in the year they decommission, they will make a big loss – because the decommissioning expense will be much bigger than the revenues from their declining production that year.

The government allows companies to claim this loss against previous profits – basically allocating some of the loss to previous tax years, which means that the profit from previous tax years becomes less. This means that the company is entitled to have the tax it paid on the change in profit refunded.

The problem with this system of carrying back losses is that it can be an obstruction to an oil company which wants to sell an asset towards the end of its life. It may want to sell the asset to a smaller company with specialist decommissioning expertise, or which wants to take on the challenge of running an old field.

The buying company may be more enthusiastic about running the old field than the selling company, but this enthusiasm may be dampened if the

Philip Reid, associate at CMS Cameron McKenna Nabarro Olswang LLP

selling company could reclaim about half of the costs of decommissioning from the government (if the tax rate was 50 per cent), and the buying company couldn't.

This buying company is then at a disadvantage to the selling company, because it does not have a long record of profits from the field, which can then be adjusted to take into account of the subsequent decommissioning expense, allowing the company to receive a tax rebate.

Companies have been looking for other resolutions to the problem, for example if the selling company sells the asset but retains responsibility for the decommissioning costs. The

government has confirmed that relief can be available in this scenario. But one of the main reasons a company might want to sell an asset is to get the messy decommissioning liability off its books.

The hope is that the government will change the legislation so that a buyer of an asset will end up in the same tax situation as the seller with regards to decommissioning the asset, or at least as close as possible in practice. This could be through transferring the tax history of the seller, or some other mechanism.

This may encourage more asset transfer deals to take place, which is in the national interest, since a smaller company may take more effort to extract the last barrels out of the reservoir, and a few more years use from the infrastructure, than a larger company.

"This could be another step towards encouraging assets to go in the right hands and maximizing economic recovery in the North Sea," Mr Reid says.

The issue of decommissioning tax relief is now coming up frequently in the North Sea merger and acquisition deals CMS is involved with, Mr Reid says. "People are live to the issue that you need to be sure tax relief is available and sits in the right place."

Different sorts of tax

A complexity to the issue is that it is tricky to calculate exactly how much tax has been paid on the profits of the asset, and at what rate, so the tax history can be calculated accurately.

Most companies have more than one North Sea asset so you can't just use the company's overall tax history.

The taxation system changed in the early 1990s. Fields with development consent granted before March 1993 were subject to Petroleum Revenue Tax (PRT) unless its "effective abolition" last year. Profits from all ields are subject to "Ring-fenced Corporation Tax" and the "Supplementary Charge".

PRT was calculated for specific fields, but Corporation Tax and the Supplementary Charge are calculated for the whole company.

Legislative options

The government, after a public consultation with interested parties, is aiming to come up with a way to manage tax reliefs which balances the needs and interests of sellers, buyers and the government.

It also needs to provide certainty for fields which are undergoing transactions during the period the legislation is being introduced.

One question under discussion is whether the ability to transfer a tax history is optional or mandatory. "Our view is that it is probably preferable for it to be optional, to avoid a situation in which people do a deal today and you get an unexpected consequence as a result of the law changing [in the future]," Mr Reid says.

"Also, it allows the parties some flexibility as to where they want the decommissioning liability to sit."

Dassault Systèmes' 3DEXPERIENCE platform collaboratively manages late life to decommissioning

Software company Dassault Systèmes' provides the 3DEXPERIENCE platform, which can be used for creating, evaluating, co-ordinating and executing decommissioning plans, with all the relevant parties involved

Dassault Systèmes' 3DEXPERIENCE platform can be used for creating, evaluating, co-ordinating and executing decommissioning plans.

This is achieved through simulation of assets, equipment and processes.

Using a universally accessible enterprise platform, all internal and external stakeholders can collaborate efficiently in real-time.

Ultra-realistic 3D visualisations and access to all project data provide the means of command-and-control.

The company has customers in the aerospace, transport, consumer goods, life sciences, marine and offshore, natural resources and the energy sector.

Dassault Systèmes' simulation capabilities have recently been demonstrated in its partnership with the Singapore government to develop a digital representation of Singapore, including all interrelated systems.

Stakeholders collaborate on the current and potential future state of the city, and virtually validate solutions to address short to long term challenges. The same Dassault Systèmes simulation applications are applied to decommissioning oil production assets.

When applied to late life asset management, the 3DEXPERIENCE platform's 3D modelling, multi-physics simulation and decision support capabilities effectively manage risk, operability and performance.

This consequently helps engineers and managers to better understand the economic viability of assets and predict when it's best to plug and abandon.

Using simulation and 3D visualisation technology, users interact with assets multi-dimensionally.

They can fully experience oil production platforms in their current or future states. This means users can, through simulation, digitally optimise and manage the complete decommissioning process in advance of any physical action.

A unified change management system integrates real-time updates. This ensures that all stakeholders are working

with the latest information and that there is a single version of truth. 'What if' scenarios can then be explored to virtually validate and plan project work.

The solutions ensure that gaps in knowledge are revealed and rectified to reduce risk during physical decommissioning.

Stakeholders collaborate at all stages on tasks that drive the innovation and efficiencies that are crucial to maximising the economic recovery of the North Sea industry.

In many cases, virtual asset models incorporate current and legacy engineering data. These often include laser scans, 2D drawings, photos, videos and computer aided design (CAD) models.

Used as a single reference point, the models evolve over the course of the project as more information is added. Over time the models become increasingly accurate digital representations of the reality.

Linking to Enterprise Resource Planning (ERP) and Industrial Internet of Things (IIoT) data sources brings further efficiencies, better equipment and contractor utilisation, and increased financial rigour throughout the extended supply chain.

3D models are used to collaboratively solve engineering issues related to dismantling equipment in the most effective way, and to plan work, safety and waste management procedures.

Virtual models can also be used for training. Virtual environments let people experience dangerous and hazardous activities – without any risk to themselves or others. Learning in the virtual world means people can fully understand processes and practice safely while gaining the confidence and experience that is required when operating in the real world.

"The primary benefits of operating with a unified and universally accessible single view of physical assets and associated work breakdown structures is that people can collaborate together to plan, simulate and optimise decommissioning tasks and campaigns, validate their decisions, and to essentially deliver cost efficiencies," says James Rosenshine, Senior Industry Executive Oil and Gas at Dassault Systèmes.

Quintiq – improving decommissioning schedules

Quintiq is a software company owned by Dassault, which specialises in helping optimise schedules.

The software can be better at optimising schedules than a person, in cases where there are many different elements, or a number of inter-relationships which must be satisfied, or both.

For example, the software might be used to work out the best schedule route for a parcel delivery driver, with 65 packages to deliver in a working day. Or it might be used for scheduling jobs with lots of inter-relationships, task y can't be done until task x is completed.

It can be surprising how much better a computer computed schedule can be than anything humans can do – by weighing up millions of different options to make the best one.

The computer can also quickly re-calculate the best schedule after something changes – for example a day of bad weather, or a piece of equipment becomes inoperable while a spare part is delivered. It can take people days to do complex rescheduling, while a computer can do it in seconds.

In decommissioning, it is fairly clear to see how this sort of software could be a great help, particularly if an oil company (or group of oil companies) put together a schedule of decommissioning jobs to be done over a five year period.

Out of all the sub-tasks, there might be some which are much easier to do in the summer, but many which can be done in the winter. There will be expensive equipment which should be used as continuously as possible (such as heavy lift vessels). There will be a limited number of staff who should be kept continuously occupied.

Quintiq has not worked in oil and gas decommissioning so far, since the decommissioning work to date has been mainly individual projects without complex scheduling needs. But as the work increases, the complexity and scheduling will get much more complex.

Quintiq has already worked with heavy lift shipping companies to help plan vessel operations.

In decommissioning, it could help with strategic planning, such as what should we do on the first day and what order should it be done in.

If there are disruption to supplies, it might prompt a rescheduling of work activities.

The software can provide a visualisation of all the dependencies involved (such as the topsides can only be removed after they have been prepared) and ensure that the schedule satisfies them.

Weather issues can also drive re-scheduling of decommissioning tasks, such as winter storms. Currently there is a strong preference to do decommissioning work in the summer rather than the winter. But if there were more sophisticated re-planning tools available, then maybe more could be done in the winter.

If there are 'hard dates' – such as certain tasks which must be completed before the heavy lift vessel arrives – this can also be included in the schedule calculation.

Or there can be other tricky parameters, for example that a certain vessel is unlikely to be available on a certain day due to a planned maintenance activity, and everything else needs to plan around it.

The software can also put together a 'risk profile', taking different factors into account to tell you whether or not your project is likely to go to plan, or where your biggest risks are.

Quintiq software is owned by Dassault Systemes, a company which produces lifecycle management software, and there is some integration between the companies' software packages.

Roland Berger - applying strategic lessons from nuclear

Strategy consulting firm Roland Berger believes that there are useful lessons which could be applied from nuclear decommissioning to the oil and gas sector

Strategy consulting firm Roland Berger, based in Munich (Germany), believes that there could be useful lessons from nuclear decommissioning in Germany which could be applied to the oil and gas sector.

The challenges encountered in German nuclear power plant projects are similar to the ones oil and gas companies are facing now.

One of the biggest challenges was implementing a new mind-set for the operators turned decommissioners. The German nuclear engineers had spent their lives in an environment focussed on safety. "Cost efficient asset management was never part of their quality and safety-driven philosophy," says Ingmar Kohl, partner energy and utilities with Roland Berger.

"If you tell these guys they now have to look at the costs, because the funds are not unlimited, it is really a big challenge."

In the nuclear industry, as in oil and gas, there is a difficult question to answer, of whether to keep on the bulk of the existing staff for a decommissioning project or bring in a new team with a different mind-set but related skill set, he says.

Another learning from nuclear decommissioning, which could be applied to oil and gas, is the need to think very carefully about your overall strategy and get the questions right at the start.

There are two basic options in nuclear decommissioning – to decommission the whole thing in one go, or to remove the nuclear fuels, lock down the reactor, and let the radiation naturally decay over time, so you can decommission it with lower contamination levels a few decades in the future.

If you decommission it now, you will be able to deploy your existing workforce, who have in-depth knowledge of the plant.

"If you look at a typical decom roadmap for a nuclear power plant - you see the same things that you would also look at for oil and gas platforms," Mr Kohl says.

The nuclear industry also has similar regulation mechanisms to oil and gas, for example covering leakage prevention and spills.

"In oil and gas, as in nuclear decommissioning, you have to think clearly about where the money will be coming from, particularly if you have to liquidate other assets in order to pay for it, and so need a strategy for that.

Here, Roland Berger offers its business development financing expertise, together with its project management and implementation experience, to a decommissioning project, to help get the project running", Mr Kohl says.

Another similarity between oil and gas and nuclear decommissioning is that both occur in a very political environment, with public concerns about the environment, safety and the loss of jobs and local tax revenues. This may make politicians more open to the idea of looking at different options.

"A lot of large operators are still trying to find ways to getting their heads around it," says Yvonne Ruf, principal at Roland Berger.

"Roland Berger's overall approach is to try to break the complex question down to something which is easier to decide on, giving different options, and attaching numbers to them", she says.

"In order to make it possible for staff to reach a decision, you have to structure the problem. You break the big difficult questions into chunks that can be understood and addressed. In doing so you can break down the risks", explains Ms Ruf.

Another issue connecting nuclear and oil and gas decommissioning is that in the UK (although not in Germany) it is possible for a company to set itself up as a 'turnkey' (start to finish) decommissioning contractor for the nuclear industry. It takes full responsibility for the task, with permission from the Office of Nuclear Regulation (ONR).

"That might be a good reference case for allowing that in the UK oil and gas sector," Mr Kohl says.

Oil and gas liabilities

A major challenge with oil and gas decommissioning is managing the liabilities, which is perhaps less an issue in the nuclear sector, if the liabilities are ultimately covered by the state.

"I think where oil and gas companies can use help and support - operationally, politically, financially - is in developing options to efficiently manage and reduce the amount of liability and transfer at least some of the risks to capable contractors," Ms Ruf says.

Oil and gas companies would prefer to be focussed on their core business, rather than worrying about liabilities.

Yvonne Ruf, principal at Roland Berger

There is probably a market for different management approaches and insurance products which can take on some of the risk, she says.

If the oil and gas company has a large financial liability, that is money which cannot be invested in other projects, which may be seen as worthwhile. Also decommissioning projects bind experts and other valuable resources that would better on areas with more value creation such as exploration and production.

According to the UK Petroleum Act, an oil and gas company will always remain partly

liable for the assets. But there may be ways to reduce the financial, organisational and legal burden, she says.

"There's limited expertise for management of the decommissioning liability."

Ownership of assets and equipment

"A big strategic question is whether it is possible to pass ownership and operatorship of a late life platform from the current owner to a smaller independent specialist", Mr Kohl says. "If it proves to be a model that can deliver cost reduction and efficiency, that's something that should be rolled out on a larger scale."

Roland Berger can also help looking at other possibilities – for example converting an old drilling rig to be used to install offshore wind farms.

Managed slow down

Another possible area of improvement is having a more managed slow-down of an offshore platform, to reduce operations costs, rather than giving it the same level of maintenance for its whole life-time.
"It is a different management philosophy rather than greenfield project development and early life production curve," Ms Ruf says. "You can save a lot of cost.

About Roland Berger

In infrastructure, incl. the oil and gas industry, Roland Berger is able to work with senior managers to develop their decommissioning road map, then take it to a more operational level, helping to set up the project organisation, and supporting the procurement process, which can involve very long term contracts.

The company looks at both the financial and operational risks – of getting projects running. Operational risks can include procurement and execution of the work.

Roland Berger focusses on asset intensive industries – including oil and gas, other energy sectors such as renewables and nuclear, automotive and manufacturing, as well as transport infrastructure, roads, rail, and in across Europe and the Middle East.

The company has also been involved in large offshore windfarm projects, including permitting and licensing, something not usually associated with a strategy consultancy.

So the company can bring in expertise and data which the oil and gas companies don't necessarily have.

The firm also has a proven track record of supporting the implementation of these strategies.
Roland Berger has been working with private and public project developments, getting infrastructure projects to 'final investment decision' (FID) stage, with a workable financing model.

Ingmar Kohl, partner energy and utilities with Roland Berger

The infrastructure practise has done a lot of "early stage work," with a focus on "infrastructure projects that are not yet -or are in the process of being proven," says Yvonne Ruf, principal at Roland Berger.

The work is especially interesting "when the market and the business models are not quite clear yet."

Decommissioning in action: the Allseas Pioneering Spirit vessel connects its lifting 'yokes' to the 24,000 tonne Shell Brent Delta platform topsides in the North Sea on April 28, 2017, setting a world lifting record