

How to avoid the problems of inaccurate or missing plant data

Plant data is key to the successful operation and maintenance of an oil or gas production platform. But the sheer bulk of information can cause problems. Here is one management solution to coping with information overload.

对石油或天然气生产平台而言，生产数据是运行与维护成功的关键。但是，此中信息量的巨大，往往会产生问题。本文介绍一种因应‘信息过载’的管理方案。

原油、天然ガス生産プラットフォームをスムーズに操業、メンテナンスするために必須不可欠なのがプラントデータ。とはいえ、膨大な情報量そのものが問題を起しかねない。情報のオーバーロードに対処するための管理ソリューションを提議する。

The volume of data involved in the operation and maintenance of an oil or gas production platform is huge, with literally tonnes of paperwork being transferred during a typical project handover. Unfortunately, the enormous bulk of this data means that it is rarely as complete or accurate as it should be, and this can give rise to quite serious problems during the operation and maintenance of the asset.

However, by implementing an asset data management (ADM) system, the partners in the Shearwater Development Alliance have managed to avoid these problems and save money.

Many owner/operators simply do not realise how poor the quality of their plant data is. But a simple audit is usually sufficient to demonstrate that a considerable amount of data is ambiguous, inaccurate or absent. More often than not, if a tagged item is selected at random and a day or two spent collecting all of the information associated with it, deficiencies in the data can be highlighted. This exercise, alone, could save money in the long run.

Inaccurate data can lead to many types of problem. For example, if a pump is continually used beyond its rated temperature, the entire plant may eventually fail. If this leads to lost production, the costs can typically be counted in millions of pounds per day. Even with planned maintenance, inaccurate data can result in the delivery of the wrong item to the site, so a tagged item may not be replaced.

Extending an asset's life

On the other hand, the availability of high-quality data optimises the chance for good plant maintenance. In many cases, this can significantly extend the life of an asset, so it generates revenue for longer while postponing the cost of decommissioning.

One of the problems with multi-million

pound assets is that they usually outlast the systems, computer-based or manual, used to store the information about them. A vast amount of paperwork is associated with most plant or platforms; much of the information is also spread between numerous computer systems. Few of these computer systems will last anything like as long as the typical asset life of 25 years or more. Yet there is always a growing core of data that must be maintained and updated from the start of conceptual design right through design, fabrication, commissioning, operation, maintenance and decommissioning. The answer lies in application-neutral data, that is to say, data that is not tied to any software program or computer hardware.

Much of the oil and gas industry has standardised on STEP-based data warehousing, but STEP is only one option. Moreover, the STEP standard is still evolving and will almost certainly continue to do so indefinitely. If a STEP-based system is used, it must be adaptable to take account of changes to STEP, or its replacement by a completely different standard. One system that fulfils this requirement for total flexibility is PETS, the ADM system developed by Quillion Ltd.

Shearwater (Fig. 1) is a central North Sea gas condensate platform being developed by an alliance between AMEC Process & Energy, Shell Expro and Heerema on behalf of four co-venturers, Shell UK, Esso UK, Arco British Ltd and Mobil North Sea Ltd.

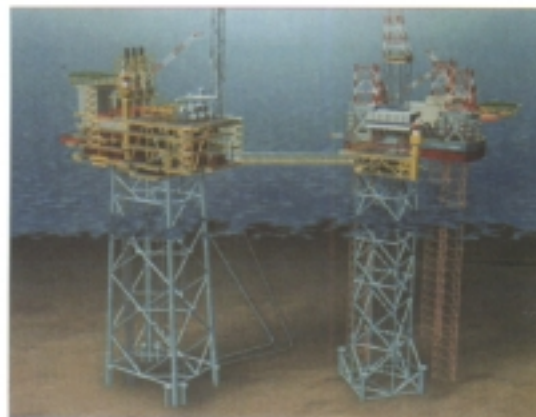


Fig. 1. An artist's impression of Shearwater.

This project has proved that a lifecycle ADM system can be implemented in a matter of months, and the costs saved can pay for the system in less than a year. While several other organisations have attempted to implement ADM systems, this is believed to be the first time that real benefits have resulted – accurate data can be accessed rapidly, enabling time and money to be saved.

Quillion's PETS product has been designed to be sufficiently flexible that it can be configured by non-programmers, allowing rapid implementation of the standard product. Moreover, the data is stored in such a way that it can be accessed throughout an asset's lifecycle. This compares favourably with the systems implemented by many other companies, some of which have been specially written to integrate between different software systems, while others have been 'off-the-shelf' packages that have needed to be customised in order to function as required. In both cases, implementation has taken an extremely long time, and few, if any users have been able to demonstrate significant cost savings or efficiency improvements.

Extensive evaluations

After an extensive evaluation of alternative systems, the Alliance decided that Quillion was the only company with a product that was sufficiently flexible for its needs. As Pete Mayhew, project IT manager, said: "We wanted a system that would allow us to get things wrong first time. And we got it. Whereas other systems may have taken three months to change if we made a mistake in our original specification, PETS could be reconfigured dynamically."

The Shearwater ADM system was implemented in two phases, allowing the concept to be proved on a sub-set of the data prior to the system being rolled out across the project. By the end of the second phase, the datastore was receiving data from 38 external software sources, there were 80 000 tagged items recorded and some 2 million items of related data.

All of this data is now used to populate at least three databases: the HUC (hook-up and commissioning), the integrated service contractor (ISC) and some of the fabrication databases. In total, for Phases 1 and 2, it is estimated that the Alliance's investment has now been more than recouped through the savings in commissioning, design and fabrication costs. It has been estimated the total savings during the design, fabrication and handover stages of the Shearwater project could be around £2 million, thanks to the use of an ADM system.

The future savings over the operational life of the asset, are likely to be substantial. It has been estimated that having high quality data available can save 2.66 per cent operational expenditure over the lifetime of an asset, largely due to a reduction in the number of scheduled stoppages and the elimination of those unplanned stoppages that typically result from inaccurate data.

At the end of an asset's life, decommissioning can be carried out more efficiently if the data is available to show it has been modified and maintained, rather than as originally designed or built. ○

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