

Sustainability and Safety Offshore – Two Sides of the Same Coin

a report by

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The sustainability agenda is at the forefront of the UK government's regulation of the UK continental shelf (UKCS). Sustainable best economic performance is inseparable from and dependent on sustainable safe performance. Optimum production and drilling performance cannot be achieved where there are unplanned interruptions. Accidents and near misses are obvious sources of interruptions and significant outages.

The UK industry and government have formally adopted the goal of securing for the UKCS the world's best safety performance by 2010. Expressed differently, the goal is to achieve best sustainable economic performance. This makes it clear that sustained inward capital investment and optimum sustained production are impossible to achieve without significant sustained reductions in accidents and other operational failures.

The defining and sharing of the offshore sustainability agenda between the industry, trades unions and the Health and Safety Executive (HSE) has presented a unique opportunity to form partnerships and align resources to secure important goals through programme working. The most significant partnership is the UK Step Change in Safety initiative, comprising leaders from the industry, trades unions and the HSE. The author is a member of the leadership team whose aim is to deliver the UK's 2010 goal. This article will discuss the three main thrusts of the Step Change programme:

- improving hazard awareness;
- taking personal responsibility for safety; and
- improving asset integrity.

The sustainability agenda for the HSE is characterised by its contribution to maintenance and life extension of existing infrastructure and adoption of new technology. This regulatory body also encourages and supports new investment and new operators taking on 'fallow licences' and invigorating old fields. The HSE has opened up communications pathways via the Department of Trade and Industry (DTI) and UK Trade & Investment (a DTI/Foreign and Commonwealth Office trade partnership) to

de-mystify the UK regime and promote good initial relations with potential new licensees and investors – both at home and overseas.

Challenges to Sustainability

Asset Integrity

Clearly, there are challenges associated with the age and condition of the existing infrastructure (see *Figure 1*). Maintenance of asset integrity on the UKCS is of the highest importance, and from 1 October 2004, the HSE has been undertaking a significant offshore and corporate headquarters verification programme. The programme is known as Key Programme 3 (KP3 or 'Asset Integrity Programme') and its aim is to help to identify conditions that oppose adequate integrity management and to work with duty holders to implement remedies. KP3 is fully aligned with theme three of the Step Change agenda.

The desired outcome for KP3 is to ensure that duty holders effectively manage the risk of failure of structure, plant equipment and systems that could lead to a major incident. The HSE is concerned about this now, because ageing infrastructure and demands to cut costs have led to concerns that, unless effectively managed, this situation will significantly increase the risk of major accidents.

The specific issues are ageing offshore infrastructure, weaknesses in the implementation of independent verification arrangements, adverse effects of cost control, reduced manning and multi-tasking (if poorly managed), maintenance backlogs, incidents due to maintenance or integrity-related failures and hydrocarbon leaks. In addition, poor succession planning – or under-investment in the supply side by the principal companies – has led to critical degradation of the industry's skill base, leading to acute shortages of competent offshore staff.

It is clear that much of the slow initial degradation has occurred in installation fabric that was not, in itself, seen as safety-critical in the run-down to planned decommissioning dates. Due to the fact that the conditions appeared gradually, industry and the HSE



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Figure 1: Age of UKCS Installations (at 2004)

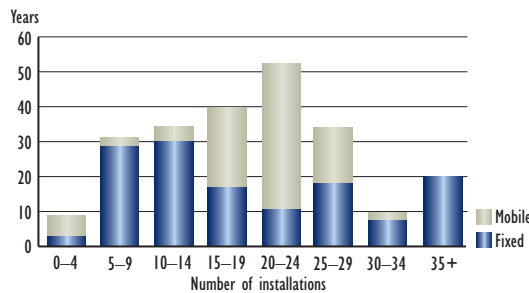
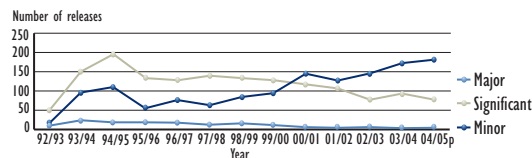


Figure 2: Hydrocarbon Leaks



have, in the past, been tackling them on a case-by-case basis. However, experience has shown that even short-term neglect can lead to rapidly accelerating degradation offshore.

There has been significant life extension of the older assets and deferred decommissioning, for a number of economic and technical reasons. The HSE wants to acknowledge the industry's commitment to working with the HSE in a partnership to tackle the issue of declining asset integrity. The United Kingdom Offshore Operators Association (UKOOA) has given significant leadership to the HSE/industry Asset Integrity Programme. At present, there are encouraging signs of sustainable reversal of some of the key indicators of poor integrity management, for example in maintenance backlogs, training, supervision and hydrocarbon leaks.

The UKOOA/HSE integrity partnership has taken the bold step of adding two further indicators of asset integrity to that of hydrocarbon releases that they have agreed to publish. The additional indicators are:

- a number of open non-compliances with respect to verification issues; and
- a measure of production losses due to plant and equipment failure.

The Health and Safety Commission's (HSC's) public service agreement with Her Majesty's (HM) Treasury (UK) includes the target of a 45% reduction in offshore major and significant hydrocarbon leaks from the 2001/2002 baseline (113). It is the Offshore Division's (OSD's) task to secure this target, and it has agreed with the industry a 10% year-on-year reduction in major and significant hydrocarbon releases against the 113 baseline. The industry is on target after a worrying

upward blip in 2004. To the end of the second quarter 2005, the provisional total number of major and significant hydrocarbon releases was 32 (against a mid-year target of 37) (see Figure 2).

Hydrocarbon leaks are a global problem. Sustaining offshore production through the maintenance of asset integrity is a key issue in all the mature offshore basins, and the asset integrity programme is being followed with interest by overseas regulators. It is not unreasonable to suggest that the UK industry is a world leader – along with Norway, probably – in understanding the issues and remedies associated with improving and maintaining integrity of offshore installations.

The continuing high oil price and high demand for oil and gas add their own pressures to the task of reducing hydrocarbon releases, as drilling activity increases and decommissioning work is postponed. These risks are exacerbated by the pressures on current levels of experienced staff in the OSD; risks to achievement of targets will remain until new recruits become fully effective.

Risk Management

Through its participation with the industry Step Change in Safety initiative and by actively pursuing partnerships with contractor trade associations (the International Association of Drilling Contractors (IADC) and the British Rig Owners Association (BROA)) the OSD is also aligning the priorities of industry to tackle the high rates of fatal and major injury accidents associated with heavy lifting operations (between ship and decks, and decks and drill floor). It appears that the UKCS has the third highest fatal and major injury rates in the UK industrial sector, after construction and agriculture (see Figures 3 and 4).

Another offshore programme (Key Programme 2 (KP2)) is targeting improvements in fatal and major injury accidents, which can be seen from Figure 4 to be roughly flatlining. The genesis of KP2 was a review of 11 fatalities in the North Sea.¹ This uncovered universal root causes, such as underestimated routine risks, risks that were not perceived (or just deemed to be acceptable), procedural violations being routine and tolerated and supervisors spending insufficient time at the worksite. The root causes can be brought under three main functions:

- risk assessment;
- procedures and job design; and
- supervision and monitoring.

1. *Step Change in Safety*, Fatality Report, <http://www.pfsstepchange.co.uk/files/SCIS%20Fatality%20Report.pdf> (accessed 9 November 2005).

Statistics reviewed from offshore statutory reporting showed that the reporting categories of deck and drilling operations had the highest numbers of fatal, major and over-three-day injuries. KP2 is mainly focused on these two operations across the UKCS, with inspections at company headquarters and offshore targeting being the topics and activities that reflect the issues of key concern. The programme is organised to ensure consistency of inspection and information gathering. The programme integrates, to a large extent, themes one and two of the Step Change agenda. The programme targets are to have no fatalities and to eliminate, as far as reasonably practicable, incidents related to deck and drilling operations offshore.

The current programme will run until 31 March 2007. Industry partnership is key to the programme's success and the BROA is co-chairing an industry workshop in November 2005 to investigate how generic issues identified by the programme can be taken forward collectively. There will also be many other representative bodies and companies involved in the programme.

KP2 is highly dependent on the application of human factors (HFs). HSE is increasing its application of HFs across all employment sectors and growing its resources in this area of risk control.

Occupational Health Agenda

The cost to the UK in supporting those suffering from ill health from all causes, especially in the context of an ageing population, means that general health issues are high on the political agenda. In the employment sector, approximately four times as many days are lost from the UK workplaces from ill health as from accidents, from a total of approximately 40 million days lost overall (see Figure 5). The HSC and HSE have therefore given health a high priority.

The OSD's work on occupational health is set in the context of the strategy for the whole employment sector in the UK, and most of the health risks chosen for onshore campaigns are also priorities offshore, e.g. musculoskeletal disease, stress, asbestos and noise. These have to be considered in the context of ageing platforms and decommissioning, smaller operators buying ageing platforms, operators that are new to the UKCS and its standards and multi-contractual sites. In addition, there are health-related issues that have a greater emphasis or are specific to the offshore workplace, such as accommodation and welfare, food hygiene and health effects in diving.

The importance of psychosocial stresses is likely to increase offshore, especially in a period characterised by increased economic performance involving

Figure 3: UKCS Injury Rates – Over-three-day Injuries

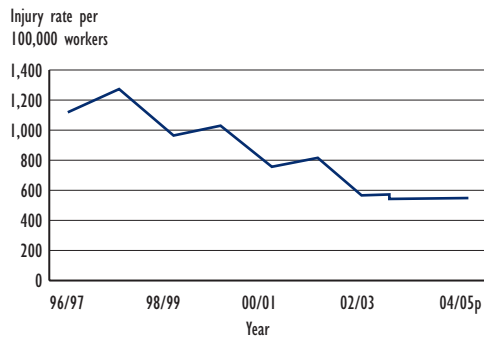


Figure 4: UKCS Injury Rates – Fatal and Major Injuries

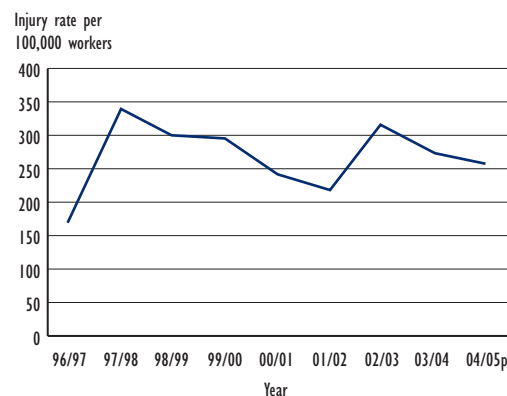
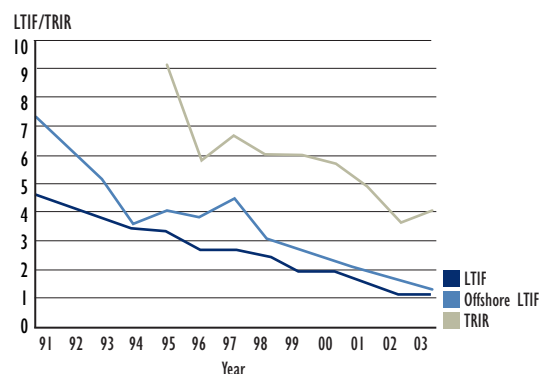


Figure 5: Lost Time Injury Frequency



LTIF = lost time injury frequency, i.e. the number of lost workday cases per million work hours; includes company and contractor personnel, onshore and offshore activities. TRIR = total recordable incident rate.

downsizing, multi-skilling, distant working, etc. The drive to make economies has also resulted in a high level of contractorisation, with long-term contracts giving more responsibility and power to the contractor. The resultant change in the balance of management control makes the interfacing of management systems crucial in ensuring safe and healthy working. The health effects of these changes need to be monitored, especially the role of management systems.

OSD's main programme on occupational health has been developed to respond to these changes and the need for a corporate-wide impact. It aims to reduce work-related illness and injury from the main offshore occupational health risks by

improving compliance with the Management of Health and Safety at Work Regulations 1999. It particularly aims to exploit the gearing effect of working in partnership with industry by influencing the supply chain relationships. The programme was launched in 2003/2004 and has involved around 12 companies. Some of the emerging findings identified include:

- a lack of focus on health issues in company management systems;
- limited corporate learning from previous inspection advice;
- use of health professionals insufficiently developed to obtain best value from their expertise;
- over-reliance on personal protective equipment rather than ensuring that risks are as low as reasonably practicable (ALARP) by other means;
- a lack of monitoring or auditing of health risk management systems; and
- underrating of the importance of supply chain management for the control of risks to contractors.

Further evaluation will consider whether the inspection approach has had an effect and whether this form of proactive inspection should be continued beyond the current programme (i.e. beyond 2006).

Sum of the Programmes

The OSD is in the process of formally evaluating the overlap between KP3 and the health programme to determine whether they would be better as an integrated entity. The relationship between the HFs element of KP2 and the health programme are more evident. Should they achieve the intended safety and health outcomes, all three programmes will also make a significant and holistic contribution to the sustainability of the industry.

Reform of the Safety Case Regulations

New Offshore Safety Case Regulations (OSCR) 2005 are expected to come into force in April 2006. The new regulations introduce a number of changes intended to relieve unnecessary burdens on duty holders and HSE, enhance the value of the safety case to the duty holder and provide a greater stimulus for continuous improvement. These aims are evident throughout the regulations, particularly the encouragement for continuous improvement provided by the duty to review and revise safety cases. The most important changes are as follows:

- three-yearly safety case resubmissions are replaced with five-yearly thorough reviews;
- some safety cases are replaced with notifications, some existing safety case particulars removed and others are made more focused;
- greater clarity is provided on the link between the safety case and the supporting sector-specific regulatory framework (such as that related to emergency response); and
- the requirement to demonstrate that risks are ALARP is replaced with a demonstration of compliance with the relevant regulations.

When the new regulations take effect, there will be fewer safety cases requiring assessment and acceptance. This will free up inspector resources that will be used to better test key claims made in safety cases about the control of major hazards.

Workforce Involvement

The systematic involvement of the workforce in securing sustainable improvements in offshore safety and health has not become the core value envisaged by Lord Cullen. This is not unique to the offshore environment – workforce involvement is central to the HSC's strategy for the rest of the UK's employment sector. As has been shown, the significant changes to the offshore industry place pressures on workers. A further key business risk for the OSD connected to the workforce is that partnership working comes to be seen by them as HSE 'cosying up to the employers'. There is some evidence of this view prevailing among offshore workers and trades unions.

The OSD's approach to the 'core value' issue has been to encourage and support the Offshore Industry Advisory Committee (OIAC) – formed of employers, trades unions and HSE, and whose job is to advise the HSC on offshore health and safety matters – to adopt increasing worker involvement as its main task. With regard to how HSE is perceived by the workforce, the OSD's response includes increasing visibility and accessibility of the division through improvements to the offshore website, distribution of offshore pamphlets to workers and presentations by inspectors to offshore staff. Reforms to the safety case regulations will require duty holders to demonstrate how the workforce has been involved in assembling or updating the installation safety case.

Global Picture

Just as in the UK, safety performance and best sustainable economic performance are inter-dependent and inseparable worldwide. The OSD carries out a

number of collaborative and supportive activities with overseas regulators – there are on-going projects with, for example, China, India, Trinidad and Tobago, Malaysia and Cuba. The OSD is also a member of a group of regulators, the International Regulators Forum (IRF), which was started in 1994 and meets each year in a member country. Members are Australia, Brazil, New Zealand, Newfoundland, Norway, Nova Scotia, the UK and the US.

Meetings are organised to share information and encourage best practices. The IRF has shared its resources to assist members' change programmes. For example, it has supported changes to the regulatory regimes in Brazil and Australia. The IRF has also developed joint activity programmes to address common (i.e. global) issues where it was felt such an approach would result in more leverage with the oil industry. The main programmes currently address how to measure global performance, mechanical lifting defects and recognition of outstanding international safety leadership in the industry.

There are several key drivers for taking a more joint approach. Firstly, the major companies in the offshore industry are global entities, and investment decisions are essentially multinational in nature and no longer dependent on national political economic considerations. Typically, budgets of the super-majors in mature areas are assigned annually, and there is intense competition for funds. National regulators have less influence now than before.

Notwithstanding the apparent global outlook of companies and the new global management spans, statistics provided by the International Association of Oil and Gas Producers (OGP) and by companies show a wide diversity of performance among major producing and drilling companies. Everyone needs to understand why this is and deal with it. The IRF provides a mechanism for comparing performance and asking companies difficult questions.

Unplanned outages for any reason – accidents and near misses are obvious causes – do not just impact the expenditures and income of major companies,

they have significant adverse consequences for governments (loss of available oil and gas for sales and domestic utilisation and, of course, loss of taxes and royalties). Unplanned events, i.e. accidents, are preventable and all governments have an interest in modelling industry performance in their regions on the performance of the best performing regions/companies.

The final point is critical. In mature areas especially, the existing infrastructure and advances in drilling and production technology are often the means by which new accumulations of oil and gas are made accessible. Experience teaches us that new assets are likely to have extensions to designed life, as longer reach and more accurately positioned wells become possible, and advances in completion and subsea techniques are made. Yet notwithstanding the high oil price of the past few years, there has been a continuing downsizing of the workforce relative to the workload and the number of installations, an erosion of the skills base, an under-investment in the technical capability of the supply side, increasing maintenance backlogs and more erosion- and corrosion-related plant failures. The infrastructures are national assets and the sustainability of the basins is dependent on suitable and sufficient stewardship by the operators. Running down an asset prior to its divestment should not be acceptable anywhere.

End Notes

Returning to the UK situation, it is an unfortunate fact that its offshore production assets, the skills base and the supply side capability are not, overall, in as good a condition as they could be. There is, however, an impressive 'can-do' approach that characterises this industry and its spectacular legacy of technical accomplishment, as well as its contribution to the UK's wealth and prosperity. There are very positive indications that the UK offshore sector has the determination to match its potential to deliver major improvements in asset integrity and the management of health and safety to secure a long and safe future for the offshore industry in the UK. ■