



UK ENVIRONMENTAL STATEMENT 2015



Contents

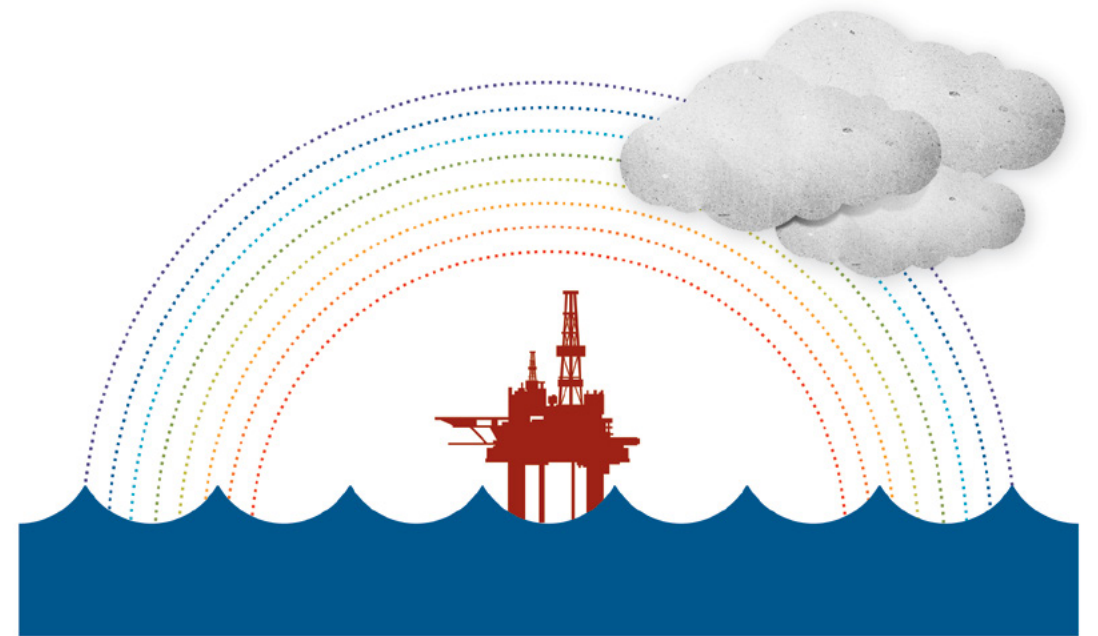
05	Introduction
07	Health, Safety, Security & Environment Policy
09	North Sea Operations
19	TAQA Commitment to Operational Excellence
21	Environmental Management System and ISO 14001
25	Environmental Performance
35	Onshore Initiatives
36	Environmental Objectives
37	Glossary

At TAQA, we are committed to world-class health, safety, security, environmental and quality (HSSEQ) performance. We work to respect the natural environment and to achieve our goals of ensuring that no harm comes to people; to providing a safe, secure workplace; and carrying-out our activities with minimal impact on the environment. Our commitment to safe and incident-free operations goes hand-in-hand with improved operational reliability, lower costs, and higher productivity.

**FOR FURTHER INFORMATION,
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Introduction

Welcome to TAQA's 2015 Environmental Statement

Our ongoing priority is to ensure our long-term sustainable future in the UKCS through a continued focus on safety and environmental performance, reliability and costs.

Despite a year of high activity we had an overall 63% and 81% decrease in the volume of oil and chemicals respectively, that were accidentally released to sea compared to 2014. However we are not complacent in this area, and continue to identify potential issues, and share and implement lessons learned. We also saw a decrease in the level of our CO₂ emissions with a reduction of 13% compared to 2014. Onshore we are working to improve our segregation of waste to ensure we hit our internal targets and continue to raise awareness on this issue across our onshore locations.

Outside of our core operations we also continue to look for other ways to make a difference. In 2015 TAQA led a significant supply chain partnership with Resource Efficient Scotland, an initiative run by Zero Waste Scotland. The project is a demonstration of our commitment to maintaining a sustainable supply chain and reducing our impact on the environment in the widest context. As part of the initiative, companies within TAQA's Scottish supply chain gain free practical help to identify –and implement – sustainability projects and cost-saving opportunities aimed at reducing energy, water and waste. TAQA continues to be an ambassador promoting the benefits of the programme and tracking the benefits accrued by our supply chain participants

Sustainability is a key business focus and this goes hand in hand with good environmental performance. We will continue to make this a priority and look at new ways to improve or further reduce our impact on the environment as we strive to become the front-runner in safe, efficient and sustainable operations and development.

Pete Jones
Managing Director, TAQA in the UK



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Sustainability is a key business focus and this goes hand in hand with good environmental performance. We will continue to make this a priority and look at new ways to improve or further reduce our impact on the environment.

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Health, Safety, Security & Environment Policy

There is no operational priority more important than protection of the health, safety and security of employees, contractors and visitors. We must also respect and protect the natural environment. At TAQA, management of HSSE is split into three areas – People, Process and Plant. Within these three areas we will manage our business operations to:

People

- Require commitment and accountability from everyone to implement this policy and work in accordance with all elements and expectations of our HSSE Management System 'Commitment to HSSE Excellence'
- Encourage an environment of openness and transparency and communicate openly with all stakeholders regarding HSSE performance
- Provide sufficient resources, training and equipment to develop and maintain highest standard HSSE systems in support of this policy

Process

- Comply with all applicable laws and regulations; make use of relevant industry standards and best practices where appropriate
- Identify, assess, manage and minimise HSSE risks
- Continuously improve HSSE performance by setting goals and objectives and monitoring our progress through regular evaluation and assessment
- Ensure that appropriate response procedures are in place to minimise the impact of any security incident or emergency

Plant

- Identify Major Hazards, assess and prioritise associated risks and identify the barriers required to assure a safe and secure working environment
- Establish regular inspection, testing and maintenance activities to ensure ongoing suitability of the barriers
- Consider the lifecycle of our assets, and in particular consideration will be given to ageing aspects and how life extension will be achieved and the associated risks managed
- Prevent pollution and minimise the impact of our operations on the environment

Everyone working for, or on behalf of, TAQA has a personal responsibility to work safely and protect the environment. Irrespective of our role or location, we are all safety leaders. If we are in doubt regarding any job we are involved with, or one which we observe, everyone is empowered to challenge and stop work.

Pete Jones
Managing Director, TAQA in the UK



North Sea Operations



Abu Dhabi National Energy Company PJSC (known as TAQA)

TAQA, meaning energy in Arabic, is the brand name of Abu Dhabi National Energy Company PJSC. TAQA is an international energy and water company listed on the Abu Dhabi Securities Exchange. TAQA strives to be safe and sustainable, and embrace the challenge of delivering affordable and reliable energy and water. TAQA is proud to align its strategy with Abu Dhabi's Economic Vision 2030, a roadmap for a sustainable economy with a focus on knowledge-based industry. TAQA's interests lie in conventional and alternative power generation, water desalination, oil and gas exploration and production, pipelines and gas storage. TAQA operates in Canada, Ghana, India, Iraq, Morocco, the Netherlands, Oman, Saudi Arabia, the United Arab Emirates, the United Kingdom and the United States.

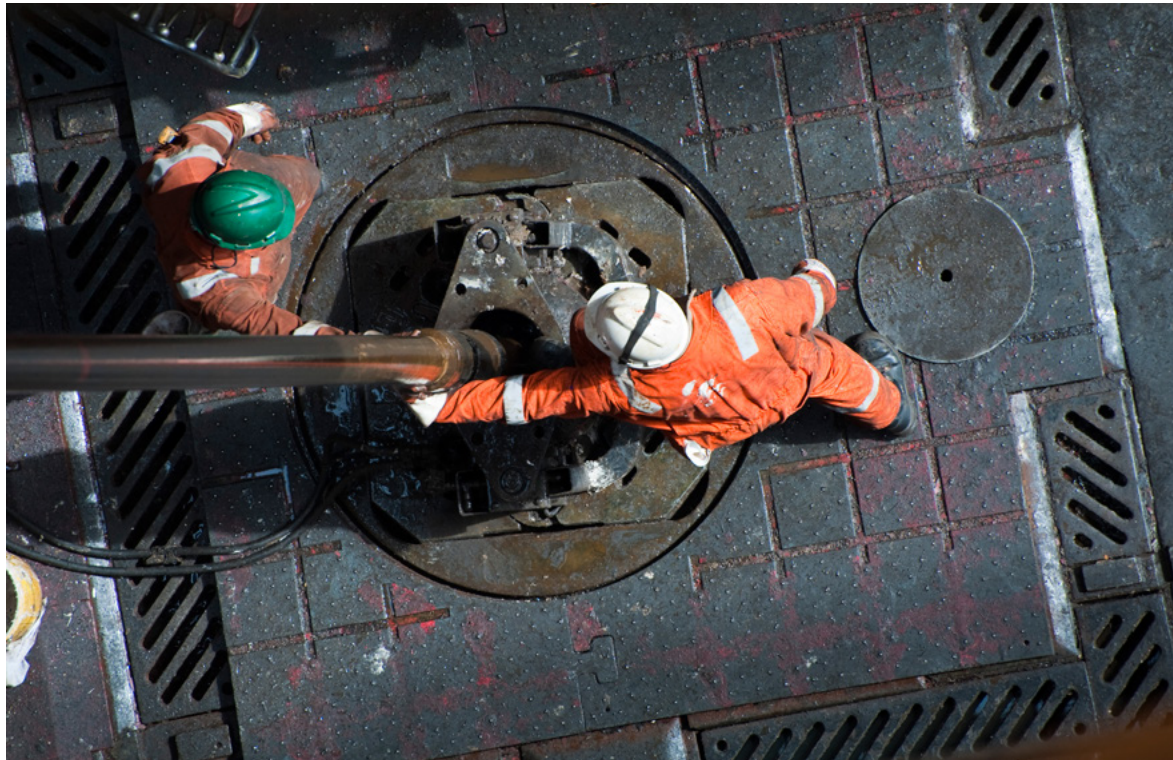


TAQA in the UK

TAQA's UK business was incorporated in 2006 and is a wholly owned subsidiary of Abu Dhabi National Energy Company. Since acquiring its first North Sea interests in 2007, TAQA has created a business which is now ranked amongst the top exploration and production companies in the UK North Sea.

The majority of TAQA's UK portfolio is wholly owned and operated by the business. In the northern North Sea it consists of 100% operated equity in the Tern, Kestrel, Eider, Otter, Cormorant North, South Cormorant, Falcon and Pelican Fields. It also has a 64.5% operated interest in the Cladhan field, 60% operated interest in the Cormorant East field and a 26.73% non-operated interest in the Hudson field. TAQA has a 24% non-operated interest in the Sullom Voe Terminal and operates the Brent Pipeline System, where it has a 16% interest.

In the central North Sea TAQA has a 70% operated interest in the Harding field, 70% in the Morrone field, 88.7% in the Devenick field and 37.04% non-operated interest in the Maclure field. In the Brae area TAQA has non-operated interests of 45.7% in Block 16/7a, 50.1% in East Brae and 65% in the Braemar field. It also has an interest in the SAGE pipeline and onshore terminal.



2015 Overview

In 2015 TAQA was firmly focused on delivering safe, efficient and sustainable operations and development in the UK North Sea in a low cost oil and gas environment.

TAQA's UK North Sea operations recorded average production levels of 56.6 mboe/d. A disciplined and focused approach to costs helped reduce net general and administrative (G&A) and operational expenditures per barrel by 18% in the UK North Sea. In addition platform uptime improved upon 2014 performance with 87% reliability, above our target of 85%.

A new offshore maintenance structure was also set in place, with the aim of doing 'the right maintenance, at the right time, with the right people'. This led to bringing all maintenance leadership positions in-house (many

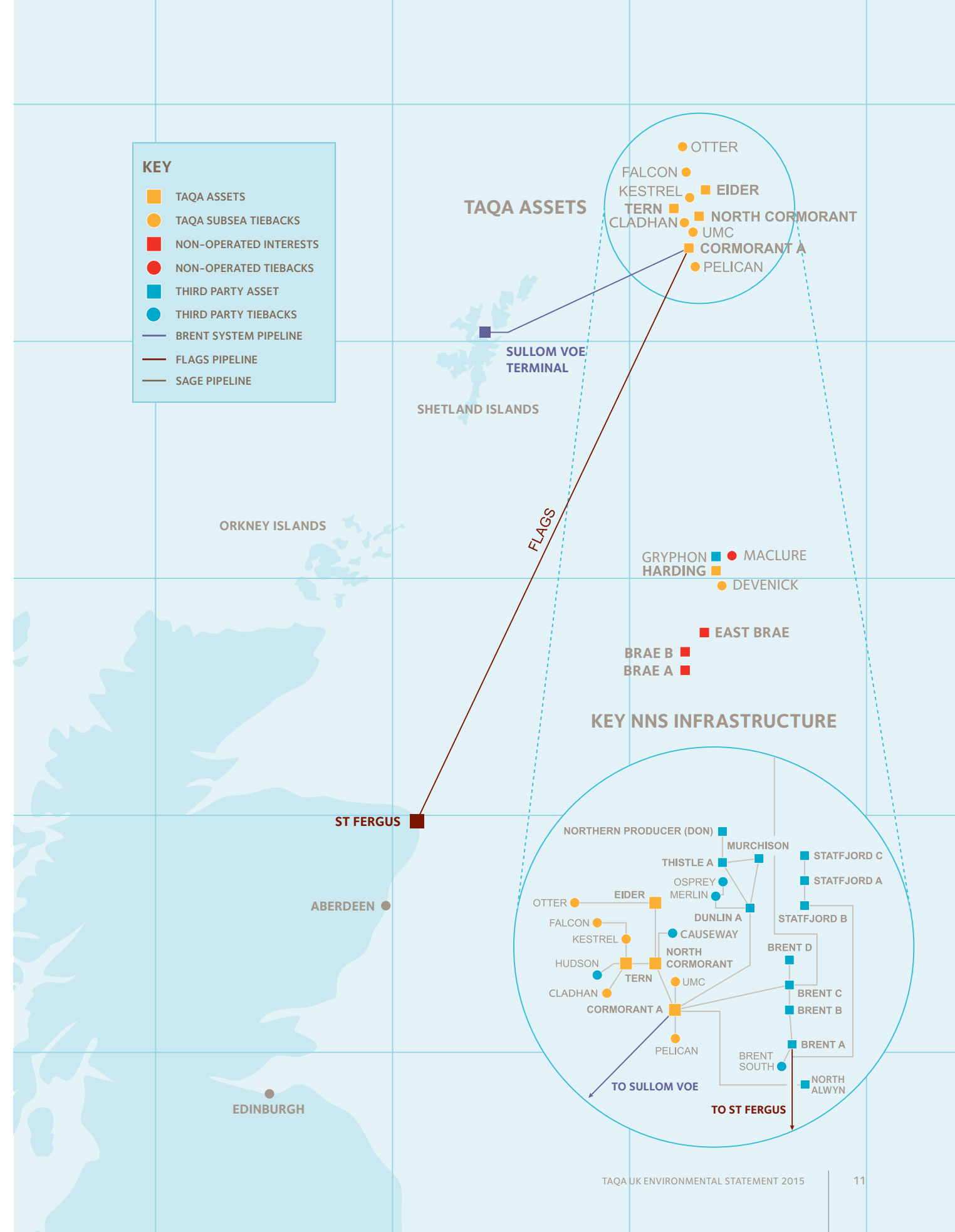
were previously contractor roles), creating a consistent organisational model across both central and northern North Sea assets and forming an offshore structure that fully complements onshore support.

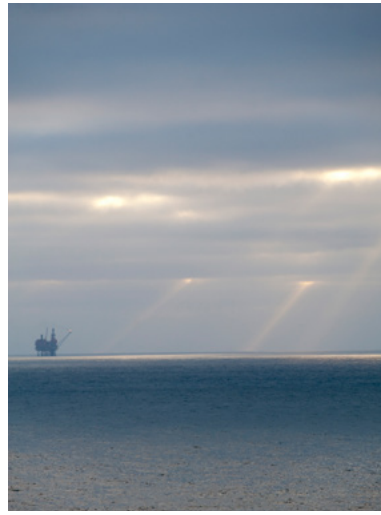
In December TAQA also hit a significant milestone when it successfully brought Cladhan, its largest field to date, on stream. The Cladhan field is located in the Northern North Sea in a water depth of approximately 150 metres. The field lies 17.5 kilometres southwest of the TAQA operated Tern Alpha platform. The development program consists of two subsea producer wells (P1 and P2) and one subsea injection well (W1) tied back to the Tern Alpha.

In 2015 TAQA completed platform drilling operations on the North Cormorant, prior to moving the platform

team to Harding. The North Cormorant operations completed a campaign of work that started in 2014, and saw the successful drilling and completion of a further water injection well and a workover of a production well. The team then transferred to Harding to continue work on Morrone that had previously started in 2014.

Mobile drilling and completion operations continued on the Cladhan field, completing the second development well in the field prior to moving to the Pelican field, where a water injection well was successfully drilled and completed. The drilling team then moved to the Devenick field to abandon a long term suspended well. A number of platform based well interventions and testing routines were carried out through the year across all assets to improve and enhance the productivity and integrity of TAQA's assets.





North Cormorant

Position:
177km (110 miles) north-east of Lerwick, Shetland

Block number:
211/21a

Operator/Duty Holder:
TAQA

Equity:
100% TAQA

Discovery date:
August 1974

Water depth:
161m (528ft)

Est ultimate recovery:
Approx. 461 million barrels of oil (61 million tonnes)

Reservoir depth:
2710m (8900ft)

Producing horizon:
Middle Jurassic

Oil production:
Via Brent System Pipeline

Storage capacity:
Nil

Type of installation:
8 legged steel jacket

Function:
North Cormorant is a drilling and production facility for the North Cormorant field. Oil and gas is imported from Eider before being separated and processed via the North Cormorant process facilities. The oil is then routed to Cormorant Alpha for onward transmission through the Brent System Pipeline to Sullom Voe Terminal.

Since 2012 the North Cormorant platform is also a production facility for the TAQA Cormorant East field and the third party Causeway and Fionn fields.

Associated gas, and gas imported from Tern, is exported through the Western Leg via Brent A and the Far North Liquids and Associated Gas System (FLAGS) Pipeline to St Fergus Terminal. Crude oil, imported from Tern, is exported to Cormorant Alpha.



Eider

Position:
184km (114 miles) north-east of Lerwick, Shetland

Block number:
211/16a and 211/21a

Operator/Duty Holder:
TAQA

Equity:
100% TAQA

Discovery date:
May 1976

Water depth:
157.5m (517ft)

Est ultimate recovery:
Approx. 109 million barrels of oil (14 million tonnes)

Reservoir depth:
2620 - 2750m (8600 - 9030ft)

Producing horizon:
Middle Jurassic (Brent) sands

Oil production:
Via Brent System Pipeline

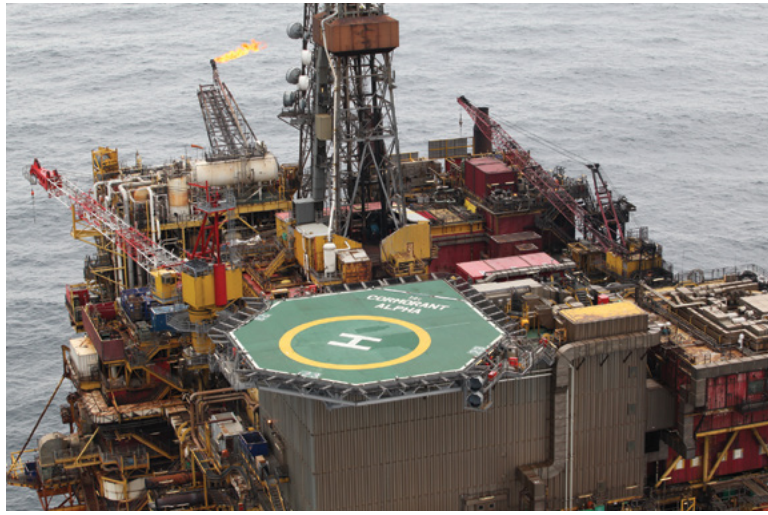
Storage capacity:
Nil

Type of installation:
8 legged steel jacket

Function:
Eider produces, meters and pumps oil and also operates as an oil producing satellite for the North Cormorant installation.

Oil and gas is exported to North Cormorant via a subsea pipeline before being exported via the Brent System Pipeline to Sullom Voe Terminal. The Eider platform is also an oil and gas production facility for the Otter field.





Cormorant Alpha

Position:

161km (100 miles) north-east of Lerwick, Shetland

Block number:

211/26a

Operator/Duty Holder:

TAQA

Equity:

100% TAQA (not including Brent System Pipeline owners' interest)

Discovery date:

September 1972

Water depth:

150m (492ft)

Est ultimate recovery:

Approx. 90 million barrels of oil (12.4 million tonnes)

Reservoir depth:

2895m (9500ft)

Producing horizon:

Middle Jurassic (Brent) sands

Oil production:

Through a 36 inch subsea pipeline direct to Sullom Voe.

Gas production:

Commingled in process separation then via Western leg to FLAGS line to St Fergus.

Storage capacity:

1 million barrels

Type of installation:

Concrete gravity structure – 4 legs

Function:

Its main function is to drill, produce, meter and pump oil and gas. Cormorant Alpha also receives oil via pipelines from the Brent C, North Alwyn and North Cormorant platforms as well as from the Pelican subsea tie-back. Oil from Cormorant Alpha is exported to Sullom Voe Terminal in the Shetlands via the Brent Pipeline System. Gas from Cormorant Alpha also joins the Western Leg Gas Pipeline link to the FLAGS.



Tern

Position:

169km (105 miles) north-east of Lerwick, Shetland

Block number:

210/25a

Operator/Duty Holder:

TAQA

Equity:

100% TAQA

Discovery date:

April 1975

Water depth:

167m (548ft)

Est ultimate recovery:

Approx. 295 million barrels of oil (39 million tonnes)

Reservoir depth:

2440m (8005ft)

Producing horizon:

Middle Jurassic (Brent) Sands

Oil production:

Via Brent System Pipeline

Gas import/export:

Via Western leg

Storage capacity:

Nil

Type of installation:

8 legged steel jacket

Function:

The Tern platform serves as a production and drilling facility for the Tern, Kestrel, Hudson, Falcon and Cladhan fields. It also provides production, gas lift and water injection facilities for the Hudson field, water injection facilities for the Eider and Kestrel fields and gas lift to the Falcon field. Crude oil is exported to North Cormorant before joining the Brent System via Cormorant Alpha. The separated gas is compressed and used as fuel gas. It is also used as lift gas for Tern, Hudson, Kestrel, and Cladhan production wells.





Harding

Position:
320km (200 miles)
north-east of Aberdeen

Block number:
9/23b

Operator/duty holder:
TAQA

Equity:
70% TAQA
30% Maersk

Discovery date:
1987

Water depth:
110m (330 ft)

Est ultimate recovery:
>250 million barrels of oil

Reservoir depth:
1676.4m (5500ft)

Producing horizon:
Tertiary (Balder)

Oil production:
Oil from Harding is exported via 24-inch diameter oil export pipeline to a submerged tanker loading system.

Storage capacity:
600,000 barrels

Type of installation:
Harding is a heavy-duty jack-up production unit, resting on a gravity base/storage tank.

Function
The basis of the Harding development is a large, heavy-duty jack-up platform. It is a fully integrated drilling and production platform for the Harding field. The topsides structure sits on the Gravity Base Tank (GBT), a reinforced concrete structure that provides the foundation. The GBT is also a T-shaped storage tank, which acts as a large storage tank for the export of crude oil. Oil production is exported from the GBT around every 49 days via a short (2km), 24" pipeline and Submerged Turret Loading (STL) system to shuttle tankers.



Brent System Pipeline

The Brent System Pipeline is responsible for transporting around 83,000 barrels of oil a day from some 22 North Sea fields. This accounts for almost 67% of the oil processed by the Sullom Voe Terminal and around 5% of UK offshore oil production.

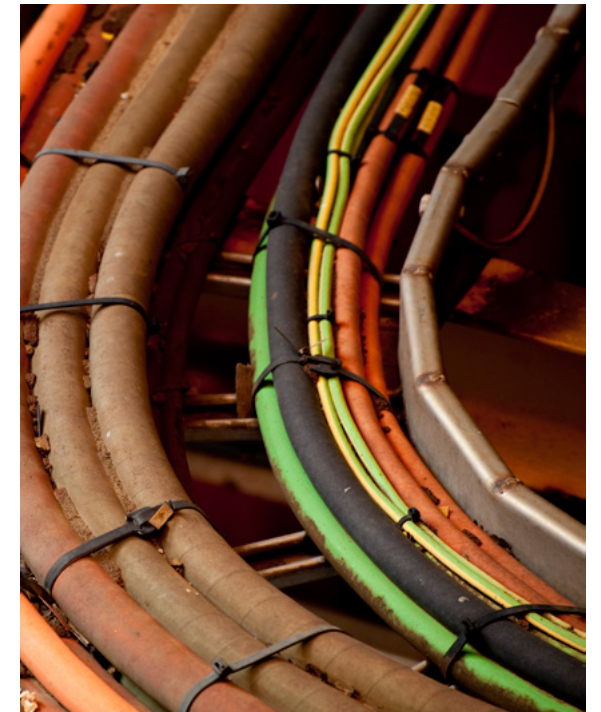
83,000 barrels – Average amount of oil transported per day.

150km – Transportation distance from Cormorant Alpha to Sullom Voe.

16% – TAQA interest.

In August 2009, TAQA became the operator of the North Sea Brent System of pipelines and facilities, taking over from Shell, which held the position since mid 1970s. The Brent System serves much of the northern North Sea sector of the UKCS bringing liquids to the Sullom Voe Terminal in the Shetlands.

The Brent System is a co-venture between companies who each own a percentage interest in the system. It consists of a proportion of the processing system on and structure of the TAQA operated Cormorant Alpha platform, as well as the 150km pipeline connecting Cormorant Alpha to the BP-operated Sullom Voe Terminal in the Shetlands.



14

TAQA'S HSSE Management System Elements And Expectations

1. Leadership, Commitment & Accountability
2. Regulatory Compliance & Industry Standards
3. People Selection, Competency & Training
4. Communication & Stakeholders Awareness
5. Hazard Identification & Risk Assessment
6. Documentation & Knowledge Management
7. Engineering Controls
8. Safe Operations
9. Crisis & Emergency Management
10. Integrity, Maintenance & Reliability
11. Project Management & Management of Change
12. Management of Third Parties
13. Incident Reporting & Investigation
14. Performance Reviews & Continuous Improvement



TAQA Commitment to Operational Excellence

Health, Safety, Security and Environment (HSSE) Management Programme

The Abu Dhabi National Energy Company (TAQA) is committed to the pursuit and attainment of a world class health, safety, security and environmental performance. It pledges to respect the natural environment, and to work to achieve its goals of ensuring that no harm comes to people; to provide a safe, secure workplace; and to carry out its activities with minimal impact on the environment. To meet this commitment, TAQA has established an HSSE policy that describes its core principles for HSSE management.

To implement the HSSE programme, TAQA has developed a set of 14 elements and expectations that make up its HSSE Management System. These elements generally correspond to the "Plan-Do-Check-Act" elements of ISO standards for health, safety, environment and quality management systems.

The HSSE programme ensures that within all of its activities and operations, TAQA will as a minimum:

- Ensure all TAQA leaders demonstrate leadership and commitment to the programme throughout the organisation
- Work constructively to influence proposed laws and regulations, and debate on emerging issues
- Provide assurance that personnel are competent; that they possess the requisite underpinning working knowledge, understanding, skill & attitude, and clearly demonstrate the ability to routinely undertake the tasks and activities of the designated work roles, safely, consistently & reliably to the minimum defined standard of performance
- Identify key stakeholder groups and develop and maintain a good working relationship with them, understanding and addressing their issues and concerns
- Perform comprehensive hazard identification and risk assessments, identify control measures, develop and implement plans to manage significant risks to an acceptable level
- Identify, maintain and safeguard important information. Ensure personnel can readily access and retrieve information. Promote and encourage constructive dialogue within the organisation to share industry recommended practices and acquired knowledge
- Design, construct, install, commission, operate, maintain, assure and decommission all TAQA assets in a healthy, safe, secure, environmentally sound, reliable and efficient manner

- Prevent incidents by identifying and minimising workplace and personal health risks. Promote and reinforce all safe behaviours
- Be prepared to protect people, the environment and TAQA's assets and reputation in the event of a crisis and/or an emergency
- Maintain operations stability and integrity throughout lifecycle of facility by use of clearly defined and documented operational, maintenance, inspection and corrosion control programs. Seek improvements in process and equipment reliability by systematically eliminating defects and sources of loss. Assessment of the degree to which Expectations are met is essential to improve Operations Integrity, maintain accountability and reliability
- Ensure that risks and exposures from proposed changes are identified, evaluated and managed to remain within pre-set (design) acceptance criteria
- Ensure contractors and suppliers perform in a manner that is consistent and compatible with TAQA policies and business performance standards. Ensure contracted services and procured materials meet the requirements and Expectations of TAQA standards
- Report and investigate all incidents. Learn from incidents and use the information to take corrective action and prevent recurrence
- Confirm that TAQA processes are implemented and assess whether they are working effectively. Measure progress and continually improve towards meeting TAQA HSSE objectives, targets and key performance indicators



Environmental Management System and ISO 14001

TAQA operates an Environmental Management System (EMS) which is set out in accordance with the requirements of the ISO 14001:2004 Standard.

The EMS details the environmental aspects of all activities associated with TAQA's offshore operations and onshore offices, including risk ranking and mitigation measures. It also documents the procedures for monitoring and reporting environmental performance and for ensuring that TAQA's activities are in compliance with all relevant environmental legislation.

At a location level TAQA's Environmental Management System addresses the following:

- Identifies possible environmental aspects, their consequences and how to control them;
- Identifies processes, roles and responsibilities;
- Oil spill management and response;
- Confirmation of operations to legal and regulatory requirements.

The EMS provides control of processes or activities which may have a potential environmental impact by means of procedures, instructions, training and education, in addition to assisting with:

- Preventing pollution;
- A systematic approach to working processes;
- Identifying potential or actual problems and finding solutions;
- Tracking environmental performance;
- Utilising natural resources effectively;
- Managing legal compliance;
- Improving awareness of workforce.





Key elements of TAQA's EMS

Environmental aspects – These are elements or activities that may result in a positive or negative impact on the environment. Where the actual impact on the environment cannot be controlled, the aspects can be. Thus TAQA's EMS is driven by significant environmental aspects; the aspects themselves form the basis for review and if necessary adjustment of procedures and working practices.

Legal requirements – Identification of applicable legal regulations is an integral part of the Environmental Management System.

Objectives, Targets and Programmes – The TAQA 'Objectives and Targets List' with respect to environmental performance is reviewed annually then translated into plans and programmes to ensure effective and successful implementation.

Training, Awareness and Competence – Periodic training and awareness are cornerstones of the TAQA Learning and Development Programme.

Communication – Effective external and internal communication of environmental issues by TAQA contributes to the success of the EMS. This is carried out internally through regular meetings and offshore visits and externally with authorities and third parties.

Document Control – All EMS documentation is systematically managed to ensure it is up to date, accurate and traceable.

Operational Control – TAQA's procedures and work instructions are set up to minimise and control the impact of environmental aspects.

Emergency preparedness and response – Location level response plans are in place and are designed to effectively manage a wide variety of emergency scenarios.

Monitoring and measurement – All incident reports, such as near misses, incidents and accidents are systematically recorded and corrective actions are tracked.

Auditing – Regular auditing ensures the continued effectiveness of the EMS. All internal audits are performed according to the TAQA audit procedure, results are then discussed in cross functional meetings and corrective actions are tracked for progress.

Management review – Management reviews are crucial to the cycle for continuous improvement. Regular Management Review meetings initiate and evaluate improvement programmes.

ISO 14001

The International Standards Organisation (ISO) is a non governmental network of global national standards institutes. ISO 14001 is the main management systems specification document in the ISO 14000 series containing the essential elements that must be satisfied by an organisation seeking registration or certification for its Environmental Management System.

The backbone of ISO 14001 systems are:

- Senior management support and participation;
- Explicit organisational structures and responsibilities;
- Good communication;
- Competency reviews and training;
- Efficient document management and recording procedures;
- Audit capabilities;
- Regular well planned management reviews;
- Continual improvement and robust corrective action culture.

The ISO 14001 philosophy is based on the **Plan-Do-Check-Act (PDCA)** management model, originally known as the Deming cycle. In continuously going through each individual step, environmental management can result in improved environmental performance.

Plan: tools for identification of targets in environmental performance.

Do: tools for achieving goals of environmental management.

Check: tools for checking the effect of environmental management.

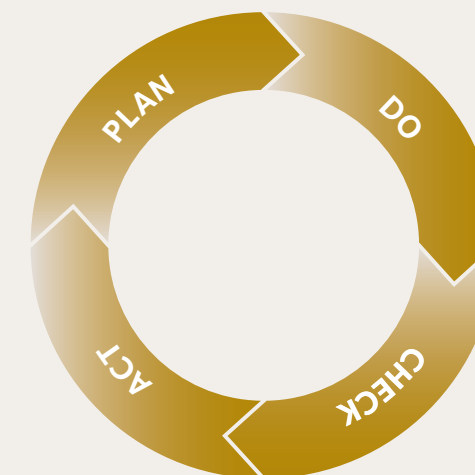
Act: tools for taking effective adjusting measures in environmental management.

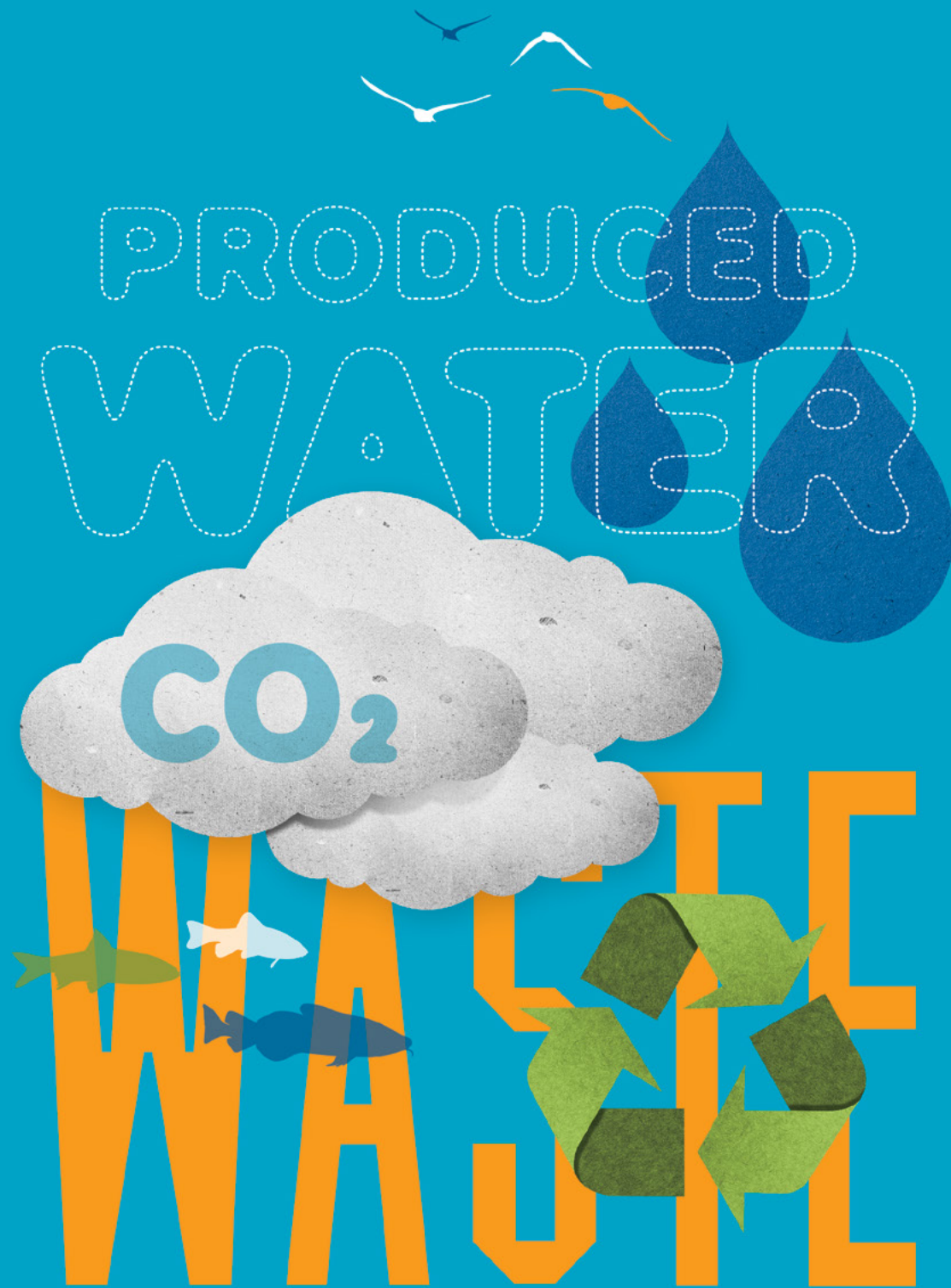
The use of the PDCA cycle helps in keeping the environmental management system a continuous process instead of an individual event. This continuous process is illustrated in the graphic opposite.

In designing TAQA's Environmental Management System to meet the requirements of ISO 14001, TAQA is effectively optimising the company's opportunity to reduce risk and liability within a structured system while enhancing its commitment to pollution control.

Two independent ISO 14001 surveillance audits were undertaken in 2015, both on and offshore. These audits covered all of the elements of ISO 14001. Both audits produced positive results with only two minor improvements identified during one of the audits. TAQA plan to transition to the new ISO 14001 standard by 2017.

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The Environmental Management System details the environmental aspects of all activities associated with TAQA's offshore operations and onshore offices, including risk ranking and mitigation measures. It also documents the procedures for monitoring and reporting environmental performance and for ensuring that TAQA's activities are in compliance with all relevant environmental legislation.
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Environmental Performance

During 2015 TAQA saw the completion of the Cladhan subsea tie-back field and a firm focus on delivering safe, efficient and sustainable operations.

Atmospheric Emissions

Atmospheric emissions from TAQA's offshore activities arise primarily from the combustion of fuel gas and diesel for power generation and the flaring of associated gas that cannot be used or exported for safety reasons (an integral part of the platform safety systems).

CARBON DIOXIDE EMISSIONS

The Greenhouse Gases Emissions Trading Scheme (Amendment) Regulations (2014) is the statutory mechanism used to regulate and reduce CO₂ emissions to the atmosphere. All TAQA assets account for carbon dioxide (CO₂) emissions by means of the cap and trade system, which allows for an allocated allowance of CO₂ to be emitted and then allowance for all subsequent releases have to be purchased.

The major combustion processes on TAQA's platforms resulting in the production of CO₂ are the generation of electrical power and the compression of gas for its transportation to shore. Reservoir gas provides the primary fuel source with diesel acting as back up.

Figure 1 shows the actual (full year) amount of CO₂ emitted against the combined Emissions Trading Scheme (ETS) allowance. CO₂ emissions in 2015 were approximately 69% greater than the ETS allowance however they were 13% lower than in 2014. The introduction of ETS Phase III in 2013 saw a significant reduction in allowances which continue to decrease each year. TAQA's overall allowance decreased by 3,685 tonnes, 1.8%, between 2014 and 2015. To account for the deficit between allowance and emissions TAQA purchased additional allowance from the trading scheme.

FIGURE 1: 2015 FULL YEAR CO₂ EMISSIONS VERSUS ETS ALLOWANCES

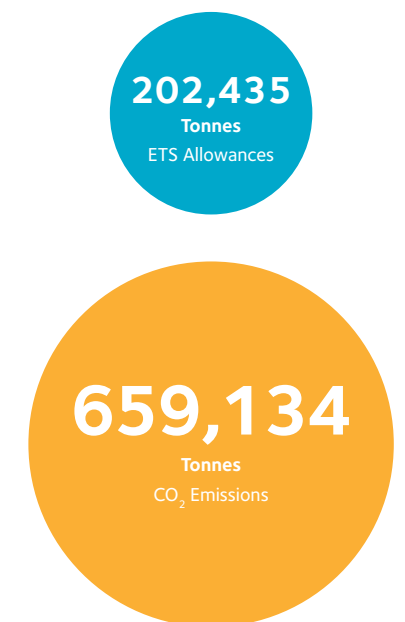


FIGURE 2: TAQA CO₂ DISCHARGES BY SOURCE

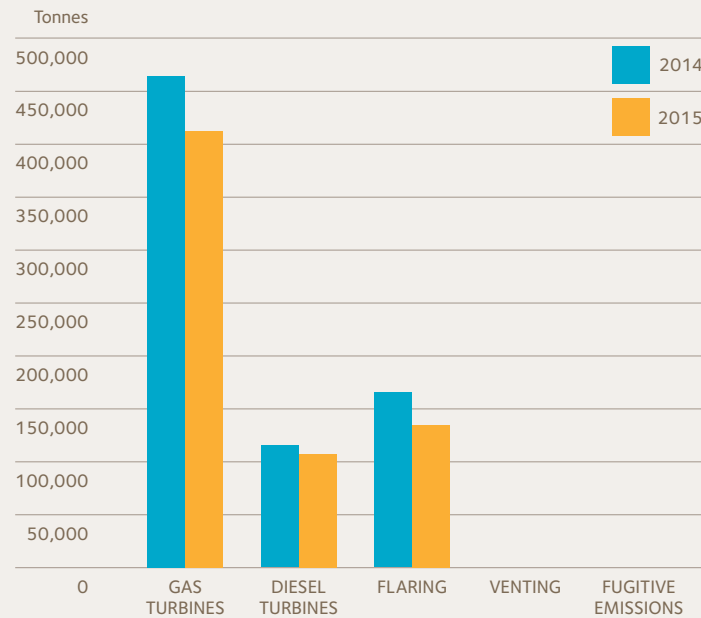
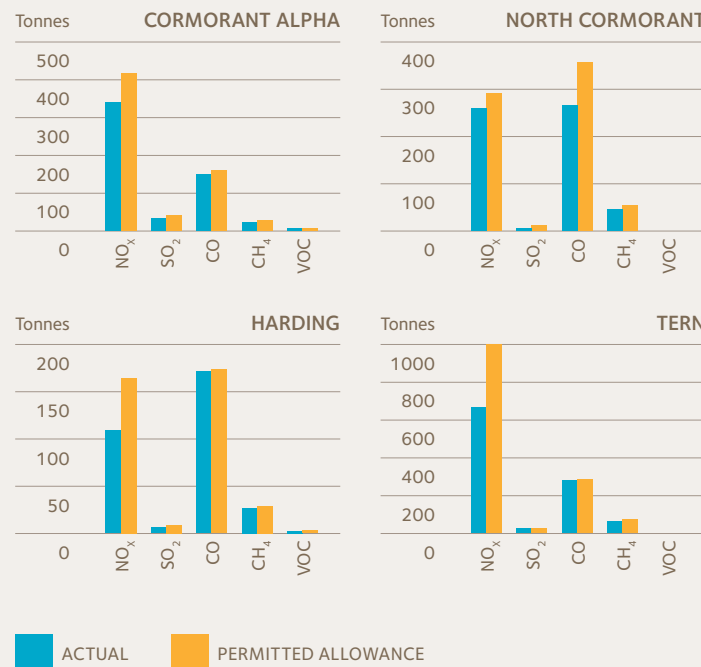


FIGURE 3: TAQA ACTUAL NON CO₂ ATMOSPHERIC EMISSIONS VS PPC PERMIT ALLOWANCE



CARBON DIOXIDE EMISSIONS (CONTINUED)

Figure 2 shows that the largest proportion of CO₂ discharge comes from turbine gas usage. The emissions from gas turbines were lower in 2015 compared to 2014. This was due to planned shutdowns on four of the five assets, plus high levels of production uptime in 2014, resulting in higher emissions in 2014 than previous years. The decrease in CO₂ production from flaring can also be attributed to the shutdowns because flaring was not required. The Harding platform experienced an increase in emissions from flaring in 2015 as it had a planned shutdown in 2014 and so production uptime was greater in 2015.

NON CO₂ ATMOSPHERIC EMISSIONS

The main combustion emission from TAQA's operations is carbon dioxide, however smaller emissions of nitrous oxide, sulphur dioxide, carbon monoxide, methane and volatile organic compounds are also produced. Non CO₂ atmospheric emissions from TAQA installations are regulated via PPC legislation covering flare emissions, vent gas emissions and combustion plant emissions.

As shown in Figure 3 all platforms were within the permitted allowance for non CO₂ atmospheric emissions. Eider is the only platform that does not have a PPC permit because the installed combustion plant on board is below the threshold required to hold a permit.

FIGURE 4: TAQA 2015 WASTE DESTINATION COMPARISON

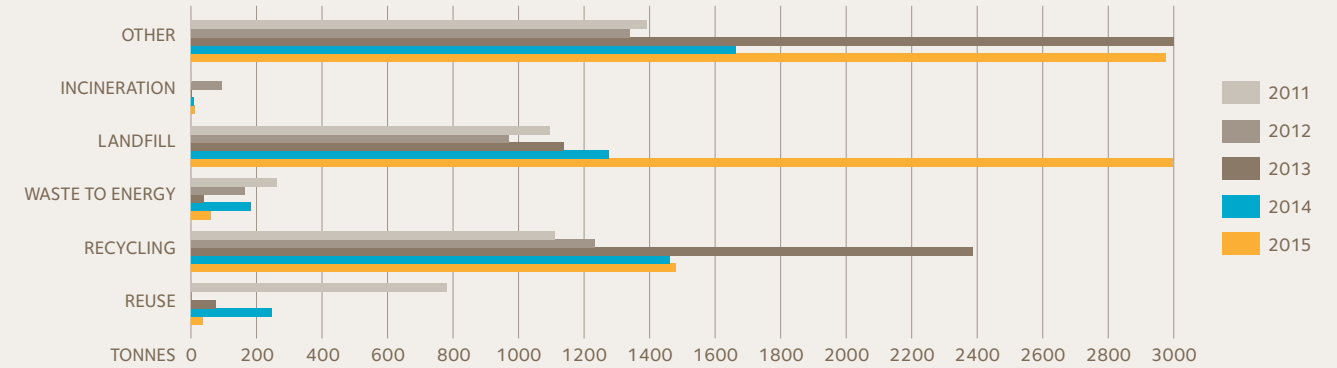
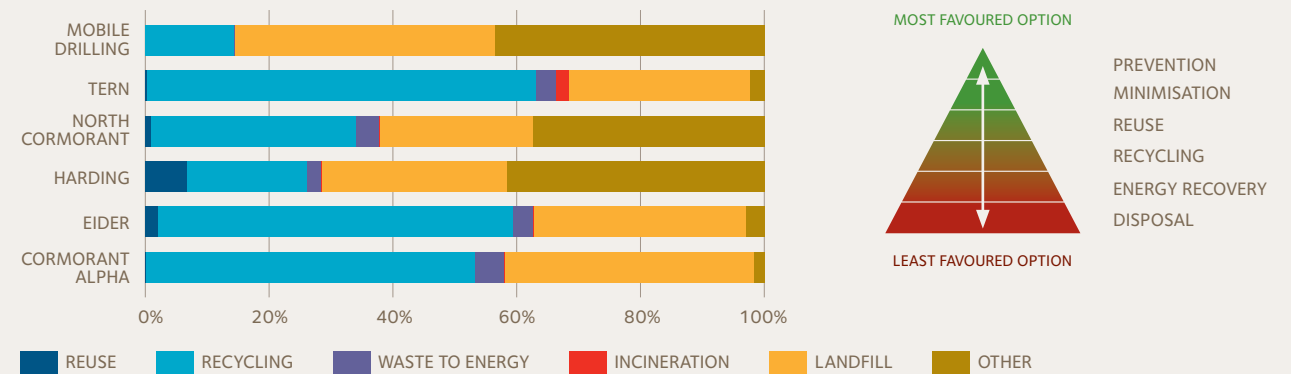


FIGURE 5: TAQA 2015 WASTE DESTINATION



Waste

A variety of solid and liquid wastes are produced from TAQA's offshore operations, including: drill cuttings, waste chemicals, tank washings, waste oil, paper, scrap metal, glass and wood. To ensure legal compliance all TAQA platforms actively segregate their waste streams to allow for more efficient use of disposal routes which minimise environmental impact.

The Merchant Shipping (Prevention of Pollution by Garbage) Regulations 1998 prohibits overboard discharge of offshore waste. All waste is therefore segregated offshore and disposed of onshore via a variety of routes including recycling, landfill, Waste-to-Energy (WtE) and incineration.

Figure 4 details the tonnage of TAQA waste going to each disposal route over the last five years. 2015 saw a rise in waste going to landfill, being recycled and disposed of under the 'other' category (which includes discharged under consent and treated waste). There was a decrease in waste being reused or sent for

processing as WtE compared to 2014. It should be noted that the amount of waste sent to WtE is dictated by the capacity of the plant handling the waste. Overall the tonnage of waste produced and handled during 2015 was 8,739.5 tonnes, which is approximately a 56% increase on 2014. This increase was due to ongoing project work, such as change out of exhaust flues, caisson removals and planned shutdowns.

Figure 5 gives an overview of the percentages of different waste disposal routes generated by the TAQA offshore locations. The majority of waste sent via the 'other' disposal route is a result of drilling operations, which produces large volumes of drill cuttings and hazardous liquids which need to be disposed of onshore. The MODU, North Cormorant and Harding platforms all had drilling operations in 2015, therefore had a large percentage of waste disposed of under the 'Other' category.

Waste (continued)

Annual waste reduction and increase waste segregation targets for general waste were set for all platforms and a MODU during 2015. The platform target for 2015 was for a 92% (average) correct segregation of general waste and for the MODU it was a 2% reduction in general waste (based on 2013 levels). This was measured by conducting quarterly general waste skip audits. The target was based on continual improvement in correct waste segregation to ensure that waste is going to the right disposal route. The waste reduction targets were met by all of the platforms except Harding. The waste targets will continue to be based on the efficiency of waste segregation going forward.



Produced Water

Produced water is created during the extraction of oil and gas from subsurface. The produced water may contain water which has come directly from the reservoir, water injected into the formation to aid the extraction of oil or gas and any chemicals added during the production/treatment process. Oil reservoirs typically produce more water during extraction compared to gas reservoirs and as the reservoirs mature the proportion of water increases. The produced water is separated from the hydrocarbons so it contains dissolved and dispersed hydrocarbons.

The Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations 2005 (OPPC) (as amended) regulate all oil discharges to sea and require that all of these discharges must be permitted by the Department of Energy and Climate Change (DECC). DECC place strict limitations on both the concentration and quantity of oil discharged within the produced water in order to protect the marine environment.

The five TAQA installations report a total of nine individual discharge streams – two on Cormorant Alpha, one on Eider, two on North Cormorant, two on Tern and two on Harding – all of which must meet the legal monthly discharge average of 30mg/l. A third discharge from Tern, the Hudson subsea tieback, is operated by Dana Petroleum, therefore the produced water discharge data is not included in this report.

Reporting discharge streams on an individual basis ensures that a constant focus can be maintained on the quality of each discharge stream via the required sample regime. If any deterioration in quality is observed then subtle process adjustments can be made to minimise the overall quantity of dispersed oil being discharged to sea – something that was previously difficult to achieve when reporting combined discharge streams.

Figure 6 shows that the TAQA internal target for average oil in produced water (OIPW) concentration for each discharge stream was met in 2015, apart from the on the Eider and Tern platforms. Eider and Tern trains A and B exceeded the internal targets by 31%, 83% and 49% respectively. The exceedance on Eider was due to a valve issue on the process train. On Tern the exceedances were a result of sand build up in vessels, which was removed during the platform shutdown. In addition the new Cladhan subsea field brought on stream in 2015 caused difficulties in managing the oil in water (OIW) levels. All discharge streams meet the legal monthly average limit of 30mg/l.

Figure 7 illustrates that all platforms met their internal produced water discharge targets for 2015. 2015 saw a 9.2% decrease in the volume of discharged produced water compared to 2014, due to platforms undertaking planned shutdowns. Harding is the only platform that has the capability to re-inject produced water. 2015 saw 89%, 5,178,451m³, of the total produced water being re-injected back into the reservoir which decreases the volume going to sea.

Figure 8 shows the actual quantity of oil discharged to sea via produced water for all TAQA platforms during 2015 compared to internal targets. A total of 229.3 tonnes of dispersed oil was discharged to sea which is 24.9% below the internal target. This is a 13.3 tonne decrease from the amount that was discharged in 2014 because of planned shutdowns across four assets.

In addition to the produced water discharge streams on the installations there was also an additional project based term OPPC permit in place during 2015. These covered the subsea pipeline operations in the Pelican field, where approximately 0.005 tonnes of oil were discharge to sea.

FIGURE 6: TAQA ACTUAL OIPW VERSUS TARGET OIPW CONCENTRATIONS

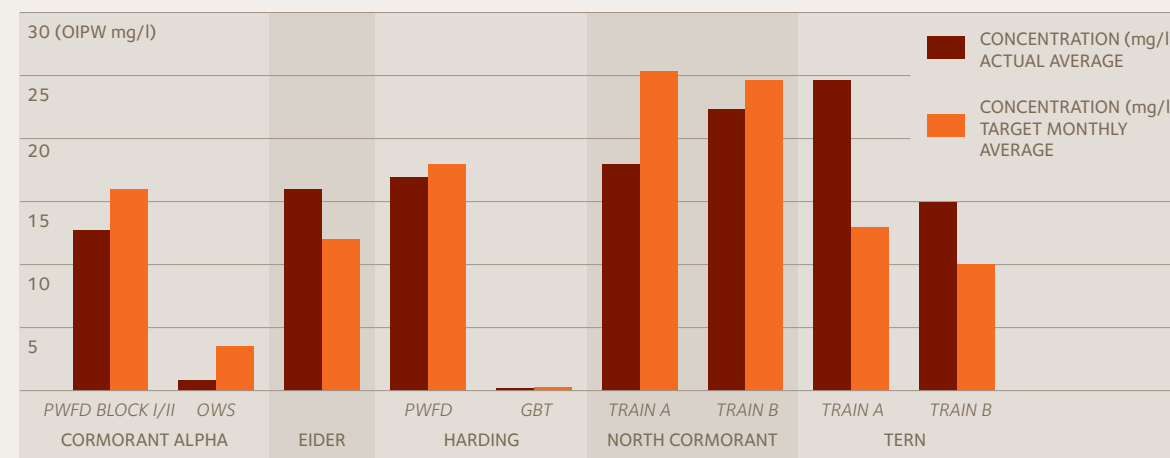


FIGURE 7: TAQA ACTUAL VERSUS TARGET PRODUCED WATER DISCHARGE

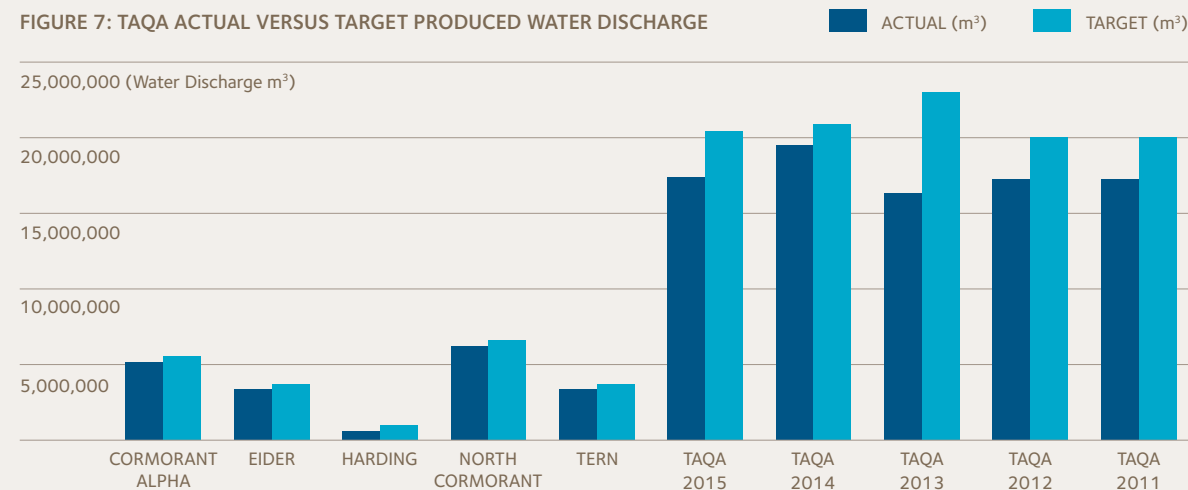
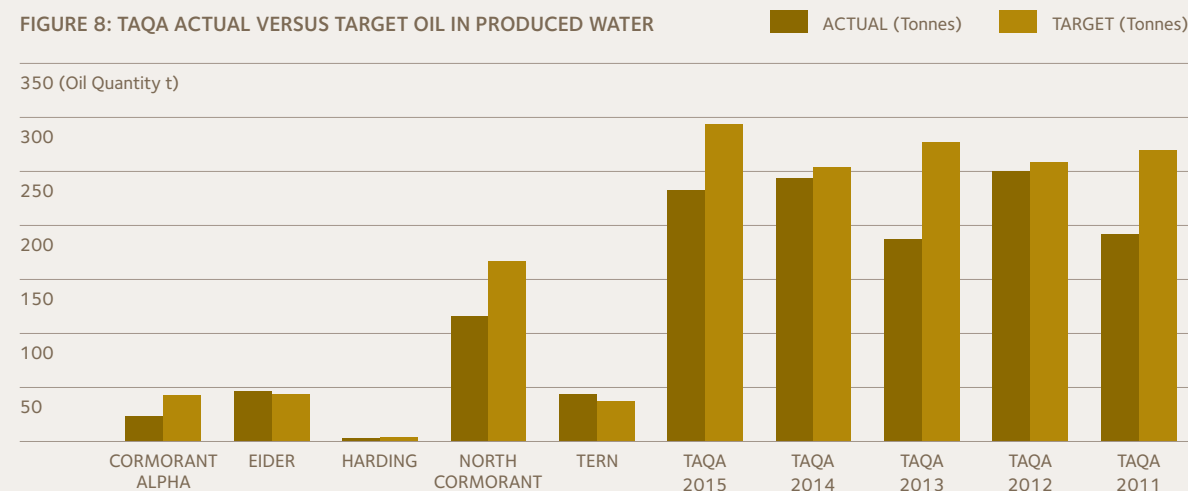


FIGURE 8: TAQA ACTUAL VERSUS TARGET OIL IN PRODUCED WATER



Chemicals

Chemical use and discharge is regulated under the Offshore Chemicals Regulations 2002 (as amended) (OCR). A permit must be obtained from DECC prior to the use and discharge of chemicals associated with production, drilling, well interventions and pipeline operations offshore.

These permits describe the selection, deployment, discharge route and environmental impact assessment for chemicals that are either used continuously or on an ad-hoc basis.

A key objective of the OCR Regulations is “to identify chemicals that might be considered hazardous and to ensure wherever possible their substitution by less hazardous or non-hazardous chemicals”.

Classification of chemicals is undertaken via the Offshore Chemical Notification Scheme (OCNS). This scheme assigns a substance a risk/hazard category. This is either a colour or a letter (dependent on the method used to model the risk), based on the varying levels of hazard/risk to the receiving environment associated with its discharge (see *Table 1*).

Table 1 also shows the relative quantities of chemicals used and discharged according to their classification under the OCNS. The quantities of chemicals used (14,384 tonnes) and discharged (3,782 tonnes) cover all those used during 2015 for TAQA's installation operations, mobile drilling, well intervention activities and pipeline operations.

A substitution warning is assigned to an offshore chemical if it is considered by CEFAS to be harmful to the environment. i.e. the chemical or one of its components fails to meet set criteria with respect to biodegradation, bioaccumulation potential or toxicity.

It should be noted that of the total 3,782 tonnes of chemicals discharged to sea during 2015, 97% of this was a discharge of either the lowest risk CHARM (Chemical Hazard Assessment and Risk Management) category Gold, or the Non-CHARM lowest risk category E. Furthermore, of the total 3,782 tonnes of chemicals discharged to sea during 2015, only 4.06% was comprised of chemicals which carry a substitution warning.

TABLE 1: 2015 CHEMICAL USAGE AND DISCHARGE QUANTITIES ACCORDING TO OCNS CATEGORY

			TOTAL USAGE (KG)	TOTAL DISCHARGE (KG)
NON-CHARM MODEL CHEMICAL CATEGORISATION	A	HIGH HAZARD	1,446.60	0.00
	B	↑	4,940.00	0.00
	C	↓	56,026.37	30.18
	D	POSES LITTLE OR NO RISK	33,847.11	33,857.36
	E		11,808,049.80	2,024,086.70
CHARM MODEL CHEMICAL CATEGORISATION	PURPLE	HIGH	0.00	0.00
	ORANGE	↑	0.00	0.00
	BLUE	RISK	72,223.70	48,763.94
	WHITE		0.00	0.00
	SILVER	↓	84,686.41	15,201.21
	GOLD	LOW	2,323,011.08	1,659,889.68
			14,384,231.07	3,781,829.07

FIGURE 9: 2015 TAQA CHEMICAL USAGE AND DISCHARGE

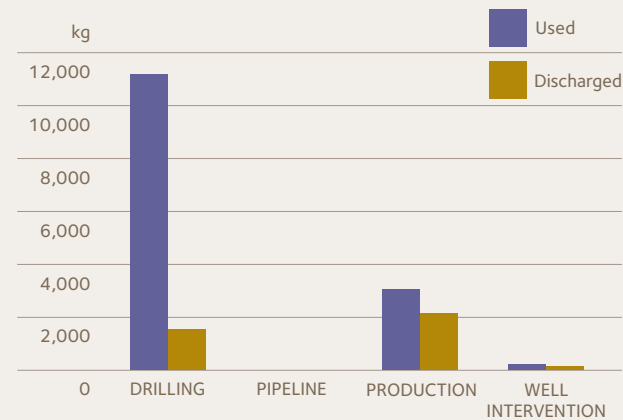


Figure 9 highlights that drilling operations used the largest amount of chemicals during 2015. This was due to a busy campaign which saw drilling, completion and work over operations on five wells between the MODU and platform drilling teams throughout the year. Even though they had the greatest chemical usage, drilling operations discharged 27.5% less chemicals than production operations. This is due to the fact that the majority of drilling chemicals on the platforms are injected into the formation or returned onshore for disposal. However the majority of chemicals used during production operations is for oil in water management of produced water therefore they are typically discharged to sea.



Accidental Spills

All offshore operations must be covered by an approved Oil Pollution Emergency Plan (OPEP). These plans describe the procedures and notifications that must be undertaken in the event of a release. They are regularly tested and exercised by offshore and onshore response teams to ensure they are robust and fit for purpose. All unplanned discharges to sea of oil and chemicals, regardless of volume, must be reported to relevant authorities (DECC, Marine Scotland, MCA and JNCC) via a Petroleum Operations Notice 1 (PON1).

At TAQA, there are a variety of systems and procedures in place to mitigate against and reduce the potential of the unplanned

releases to sea. If a loss of containment does occur whether it reaches the sea or is recovered at the location, it is captured in the company's incident reporting database. The release is then subject to investigation to identify the root cause.

Table 2 shows the number of PON1s submitted by TAQA during 2015, detailing if it was an oil or chemical release and the corresponding quantity. 38 releases took place during 2015 which is an increase on the 24 reported in 2014. However there was an overall 63% decrease in the volume of oil released to sea, down from 3.5 tonnes in 2014 to 1.3 tonnes in 2015. 2015 also saw a decrease in the volume of chemicals released to sea from 7.2 tonnes in 2014 to 1.4 tonnes.

TABLE 2: ACCIDENTAL SPILLS TO SEA

PLATFORM	DESCRIPTION OF OIL SPILL	QUANTITY OF OIL SPILLED (TONNES)	DESCRIPTION OF CHEMICAL SPILL	QUANTITY OF OIL CHEMICAL SPILLED (TONNES)
Cormorant A	Spill of diesel during bunkering operations	0.01	Underwater Service Water Pump failure	0.008
	Minor bubbling from PUP-13 subsea wellhead	0.000015		
	Minor bubbling from PUP-13 subsea wellhead	0.000015		
North Cormorant	Hydraulic oil spill from burst crane hose	0.000824	Loss of inhibited potable water through passing valve in cement batch tank	0.82
	Hydraulic oil spill from fire pump during testing	0.01314		
	Oil spill from hole in Cormorant Alpha pig launcher hazardous drains during pigging operations	0.0425		
	Produced water spill due to a passing flow wing valve	0.000862		
	Spill of hydraulic oil from fire pump	0.004982		
Tern	Diesel spill from fire pump fuel tank	0.036	Deoiler spill via hazardous drains from tote tank	0.0318
	Oily water spill via loose discharge hose from cleaning skip	0.03		
	Diesel leak from Fire Pump fuel tank	0.04		
	Lube oil spill from self-regulating pressure control valve instrument pipework shearing	0.02		
Mobile Drilling	Spill of OBM to sea during riser disconnection operations - oil	0.256	Spill of OBM to sea during riser disconnection operations - Chemicals	0.605

PLATFORM	DESCRIPTION OF OIL SPILL	QUANTITY OF OIL SPILLED (TONNES)
Harding	Hydraulic oil spill due to seal failure on conductor tensioner slot 5	0.022
	Hydraulic oil spill due to seal failure on conductor tensioner slot 6	0.036
	Spill of hydraulic fluid from umbilical control panel	0.2
	Hydraulic oil spill due to seal failure on conductor tensioner slot 6	0.023
	Hydraulic oil spill due to seal failure on conductor tensioner slot 8	0.0195
	Hydraulic oil spill due to seal failure on conductor tensioner slot 7	0.0175
	Hydraulic oil spill due to seal failure on conductor tensioner slot 7	0.0105
	Hydraulic oil spill due to seal failure on conductor tensioner slot 4	0.0175
	Hydraulic oil spill during decanting operations for conductor tensioner maintenance	0.0175
	Waste oil spill during hose flushing operations	0.005
	Hydraulic oil spill due to seal failure on conductor tensioner slot 20	0.025
	Hydraulic oil spill from conductor tensioner unit hose	0.01
	Annular safety valve hydraulic hose failure	0.05
	Hydraulic oil spill due to seal failure on conductor tensioner slot 20	0.015
	Spill of hydraulic fluid from PC1 and PC3 Conductor Tensioner Unit	0.04
	Hydraulic fluid spill due to a down hole safety valve tubing failure	0.23
	Hydraulic oil spill due to seal failure on conductor tensioner slot 23	0.02
	Hydraulic oil spill due to seal failure on conductor tensioner slot 9	0.047
	Hydraulic oil spill due to seal failure on conductor tensioner slot 19	0.02
	Hydraulic oil spill due to seal failure on conductor tensioner slot 19	0.003
Spill of hydraulic fluid from Gas Lift Wing Valve due to hose failure	0.022	

The Eider platform reported no accidental oil or chemical spills and the Harding platform reported no accidental chemical spills.



Onshore Initiatives

As a responsible energy company, TAQA continually looks to support the communities in which it operates. We have an active corporate social responsibility programme which looks to achieve three overarching goals: protect the environment from the impact of our operations; support the local communities where we operate; and increase education, potential and creativity.

Carshare

The TAQA CarShare programme allows personnel based at TAQA House to share journeys with colleagues who have a similar route to work. Car-pooling leads to a reduction in the environmental impact of commuting to work as well as reducing the number of cars requiring a parking space. TAQA also shares commuter transport with neighbouring companies in the industrial estate at Westhill in order to limit the number of buses needed for the same route.

Recycling old IT equipment

TAQA worked with a local charity ReBOOT, which aims to preserve and protect the environment for the benefit of the community by re-using and recycling IT materials. TAQA IT equipment, which included backup tapes, hard drives and laptops, went through a thorough process of data destruction before being re-used. The equipment was either donated to charities and community organisations, or sold at a low cost to support the training of volunteers and unemployed individuals.

Resource Efficient Scotland

TAQA is taking the lead in the Resource Efficiency Scotland supply chain partnership programme, an initiative delivered by Zero Waste Scotland. Via the initiative companies within TAQA's Scottish supply chain can get free practical help to identify – and implement – sustainability projects and cost-saving opportunities.

A launch event in Aberdeen at the end of August 2015 was attended by over 150 representatives of supply chain companies. Many are now set to take the opportunity forward and are signalling their commitment to make a resource efficiency pledge, such as agreeing to an audit exercise or appropriate environmental training for staff. TAQA will continue as an ambassador, promoting the benefits of the programme and tracking the benefits accrued by our supply chain participants.

North Sea Bird Club

The North Sea Bird Club (NSBC) provides a recreational pursuit for people employed offshore; they are encouraged to obtain, collate and analyse observations of all birds seen offshore and as a result the club currently holds in excess of 140,000 records of birds, cetaceans and insects reported since it was established in 1979.

TAQA has an annual membership to the North Sea Bird Club and actively encourages all of its offshore assets to record and report any sightings to the club. For example, in October 2015 crew on TAQA's Cormorant Alpha platform helped rescue an owl which had crash-landed on the platform. The bird was airlifted to the Scottish SPCA onshore and the event was subsequently recorded by the club.



Environmental Objectives

Each year a number of key objectives are set. The purpose of these objectives are to help achieve and demonstrate continual improvement in the environmental performance of TAQA in the UK. Each objective is made up of a number of individual targets. The table below provides an overview of the status of the 2015 objectives at year end.

OBJECTIVE		STATUS
1	Environmental Studies/Assurance Activities	Partially Complete (>75%)
2	Offshore Operations Continuous Improvements	Partially Complete (>75%)
3	Environmental Engineering Control Improvements	Incomplete/Not Achieved (<75%)
4	Waste Management Continuous Improvements: Reduction of waste to landfill both onshore and offshore (see below):	Completed/Achieved (>90%)
	a) 92% (average) correct general waste segregation for offshore	Completed/Achieved (>90%)
	b) 75% (average) correct general waste segregation for onshore	Partially Complete (>75%)
	c) Reduce percentage of John Shaw general waste by 2%	Completed/Achieved (>90%)
5	Environmental Management System Continuous Improvements	Incomplete/Not Achieved (<75%)

■ COMPLETED/ACHIEVED (>90%)
 ■ PARTIALLY COMPLETE (>75%)
 ■ INCOMPLETE/NOT ACHIEVED (<75%)

Overall three of the eight objectives in 2015 were achieved, three were partially completed (>75%) and two were not fully completed. The majority of objective 3 targets were completed, however the objective was not met due to the incompleteness of the Environmental Critical Element project as a result of legislation changes and a delay in guidance being issued by the regulator. In addition objective 4 was partially met by four of the five offshore platforms, with the Harding platform only missing the 92% (average) correct general waste segregation target by 4%. The other objectives were not achieved due to a re-prioritisation of the overall business plan and unforeseen time constraints and so have been rolled forward into the 2016 objectives.

In 2016, TAQA is continuing its efforts on focussed objectives in five key areas:

1. Environmental Studies/Assurance Activities
2. Offshore Operations Continuous Improvement
3. Environmental Engineering Control Improvement
4. Waste Management Continuous Improvement
5. Environmental Management System Continuous Improvement

Glossary

CEFAS
Centre for Environment, Fisheries and Agricultural Science

CH₄
Methane

CHARM
Chemical Hazard Assessment and Risk Management

CO
Carbon Monoxide

CO₂
Carbon Dioxide

DECC
Department of Energy and Climate Change

EMS
Environmental Management System

ETS
Emissions Trading Scheme

FLAGS
Far North Liquids and Associated Gas System

GBT
Gravity Base Tank

HSSEQ
Health, Safety, Security, Environment and Quality

ISO 14001
International Standards Organisation 14001 – specifies the requirements for an environmental management system

JNCC
Joint Nature Conservation Committee

mboe/d
Thousand Barrels Oil Equivalent per Day

MCA
Maritime and Coastguard Agency

MODU
Mobile Offshore Drilling Unit

NO_x
Oxides of Nitrogen

OCR
Offshore Chemicals Regulations (2002) (as amended)

OCNS
Offshore Chemical Notification Scheme

OIPW
Oil in Produced Water

OPEP
Oil Pollution Emergency Plan

OPPC
Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations (2005) (as amended)

OWS
Oily Water Separator

PON
Petroleum Operations Notice

PPC
Offshore Combustion Installations (Pollution Prevention and Control) Regulations (2013)

PWFD
Produced Water Flash Drum

SO₂
Sulphur Dioxide

UKCS
United Kingdom Continental Shelf

VOC
Volatile Organic Compound

WtE
Waste-to-Energy

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