Offshore Petroleum Regulator
for Environment & Decommissioning

UNIVERSITY of STIRLING

QUALITY REVIEW OF OFFSHORE PETROLEUM DEVELOPMENT ENVIRONMENTAL STATEMENTS AGAINST THE EIA DIRECTIVE

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1 Introduction

This project reviews the quality of environmental statements (ES) for offshore oil and gas developments in the United Kingdom (UK) and the Falkland Islands (FI).

The original EIA Directive (85/337/EC) has been in force since 1985, and was amended three times (1997, 2002 and 2009) before being codified by Directive 2011/92/EU (hereafter referred to as The EIA Directive) Further changes to the EIA were implemented in 2014 by Directive 2014/52/EU (The Amending Directive) which introduced quality control mechanisms through two cumulative provisions; ensuring that the ES (the Environment Report in the Directives) is produced by Competent Experts and that the Competent Authority has, or has access to, the necessary expertise to examine the ES. The controlling regulations for the offshore hydrocarbons industry on the UK Continental Shelf (UKCS) are the Offshore Petroleum Production and Pipe-lines (Assessment of Environmental Effects) Regulations 1999 (as amended) (EIA Regulations) which transpose the parent EIA Directive into domestic UK law. The Amending Directive provisions came in to force through amendment of the EIA Regulations in May 2017.

The review is framed against the requirements of the revised EIA Directive[1] and subsequently the EIA Regulations. It systematically assesses the quality of ES documents submitted since recent amendments were transposed into UK law and analyses the implications for decision

[1] Council Directive (EC) 2014/52/EU amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment

makers. A single development ES from the Falkland Islands is also assessed using the same methodology to compare the quality between jurisdictions. It has been more than 10 years since the last review of UK ES quality (samples between 2000-2005) and there is an expectation that ES quality should have improved to reflect the changing landscape of regulations and revised guidelines.[2]

Objectives:

- To evaluate the preparation and assessment of offshore development Environmental Statements (ESs) and ensure that these meet the requirements of the EIA Directive.
- To analyse ES documents submitted and approved between May 2017 and May 2019 to determine whether the quality has improved since the previous review.

Research aims:

- To locate strengths and weaknesses of approved ESs and consider the overall quality of documents as submitted.
- To consider what the implications of the UK quality results are regarding the Falkland Islands and whether ES quality is aligned.

2 EIA legislative context and framing

This chapter investigates relevant interdisciplinary literature in three sections; presenting a brief description of the evolution of the EIA process and the legislative setting (section 2.1) before focusing on EIA requirements for offshore petroleum developments in both the UK and FI (sections 2.22 and 2.33).

2.1 EIA legislative context

Environmental Impact Assessment (EIA) refers to the evaluation of the effects likely to arise from a project (or other action) affecting the natural and man-made environment.[3] An environmental statement (ES) is the document produced following the assessment of effects,

[2] Adam Barker, Carys Jones, 'A Critique Of The Performance Of EIA Within The Offshore Oil And Gas Sector' (2013) 43 EIAR 31.

[3] Christopher Wood, *Environmental Impact Assessment A Comparative Review* (2nd edn, Pearson 2003) 1

and it is this document which is subsequently reviewed, consulted upon and ultimately approved or rejected for a given development or activity.

The European Union (EU) eventually adopted the EIA Directive in June 1985 despite some resistance from the UK government; creating a level playing field for basic environmental protection across Member States (MS).[4] The Directive distinguished between Annex I projects which required mandatory EIA (listed projects that are considered to have significant effects on the environment e.g. hydrocarbon developments) and Annex II projects where MSs had the discretion to determine whether EIA was required.[5] EIA was a reluctant addition to the planning process within the UK, and was only incorporated following pressure from the EU and the adoption of the parent EIA Directive.

2.2 UK offshore EIA

Offshore petroleum developments fall outside of the terrestrial planning regulations and are covered under their own legislation (Petroleum Act 1998) with final consent decisions resting with the Secretary of State (SoS) as opposed to an individual planning authority.[6] Offshore petroleum developments on the UK Continental Shelf (UKCS) require an assessment of environmental effects under the Offshore Petroleum Production and Pipe-lines (Assessment of Environmental Effects) Regulations 1999 SI 1999/360 which were most recently amended in 2017 in accordance with the changes to the parent EU EIA Directive.[7] Under these regulations, and in respect of this particular study, an ES is required for:

'The extraction of petroleum and natural gas for commercial purposes where the amount extracted exceeds 500 tonnes per day in the case of petroleum and 500,000 cubic metres (m^3) per day in the case of gas.'[8]

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[4] Council Directive (EC) 85/337/EEC on the assessment of the effects of certain public and private projects on the environment; Christopher Wood, *Environmental Impact Assessment A Comparative Review* (2nd edn, Pearson 2003) 36

[5] Christopher Wood, *Environmental Impact Assessment A Comparative Review* (2nd edn, Pearson 2003) 36

[6] UK Public General Act, The Petroleum Act 1998 c.17

[7] The Offshore Petroleum Production and Pipe-lines (Assessment of Environmental Effects) Regulations 1999 SI 1999/360 and supporting instrument, The Offshore Petroleum Production and Pipe-lines (Environmental Impact Assessment and other Miscellaneous Provisions) (Amendment) Regulations 2017 SI 2017/582

[8] The Offshore Petroleum Production and Pipe-lines (Environmental Impact Assessment and other Miscellaneous Provisions) (Amendment) Regulations 2017 SI 2017/582 These regulations also specify a requirement for EIA for pipelines over 40km and over 40mm, but no large pipeline projects that would fall under this requirement were

The most recent amendments to the EIA Directive[9] (and subsequently UK EIA legislation) 'aim(s) to simplify the assessment process and reduce the administrative burden without weakening existing environmental safeguards'.[10] These amendments include a requirement for an ES to be produced by competent experts (who must demonstrate relevant expertise and qualifications of key personnel), which was previously highlighted as an area of weakness in ES quality reviews.[11] There are also additional new Articles (8, 9, 10) that relate to the decision making process, timelines, consideration of consultation results and penalties for national infringements amongst other changes.[12] Schedule 2 of the EIA Regulations (information for the environmental statement) has evolved to contain more detailed requirements than the original 1999 Regulations, a summary of which is detailed in Appendix 2. The Department for Business, Energy and Industrial Strategy (BEIS) is the government department with responsibility for the oil and gas industry in the UK, alongside the Oil and Gas Authority who deal with licensing and consent. Environmental matters are administered by the BEIS Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) as the competent authority, specifically through its Environmental Management Team (EMT) and Offshore Environmental Inspectorate (OEI), together responsible for assessment and overseeing monitoring and compliance. OPRED publish advice and guidance alongside the formal regulations and legal requirements. The EIA Guidelines formed an important part of this quality review, providing an accessible description of the parent EIA Directive, legislative

submitted during the defined study period. A single ES for a specific pipeline was part of the study sample as there had been material changes since the original ES submitted for the wider Field Development and as such a new ES was undertaken specifically for the proposed pipeline.

[9] For detail regarding the consultation and amendment process please visit the European Commission website at <http://ec.europa.eu/environment/eia/review.htm> which details the public consultation and contains a report on the application and effectiveness of the EIA Directive (COM(2009)378)

[10] Jemma Lonsdale *et al*, 'The Amended European Environmental Impact Assessment Directive: UK marine experience and recommendations' (2017) 148 Ocean & Coastal Mngmnt 131

[11] Adam Barker Carys Jones, 'A Critique Of The Performance Of EIA Within The Offshore Oil And Gas Sector' (2013) 43 EIAR 31; Kaja Peterson, 'Quality of environmental impact statements and variability of scrutiny by reviewers' (2010) EIAR 30, 3, 169

[12] BEIS OPRED, '*The Offshore Petroleum Production and Pipelines (Assessment of Environmental Effects) Regulations 1999 (as amended) – A Guide*' (Rev 5 2019) <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 24 July 2019

setting, OPRED competencies and responsibilities and interpretation on the national UK regulations.[13]

A quality review of ESs for offshore petroleum developments was conducted in 2007 on behalf of the UK Government Department for Business, Enterprise and Regulatory Reform (now BEIS).[14] Periodic quality reviews were also recommended in the 2011 "Maitland Review" and BEIS OPRED have committed to undertaking these.[15] In 2017, BEIS OPRED began the process to commission a repeat study that would focus on any improvements that have been made and to review the approach taken with regard to the preparation and assessment of ESs to ensure that they were both 'consistent' and 'acceptable'.[16] Due to a number of constraints, that project is not yet underway, which provides an opportunity for this project to mirror the earlier review on a smaller scale and offer preliminary views on the current quality of ES as submitted to OPRED by operators.

2.3 Falkland Islands offshore EIA

The Falkland Islands are a British Overseas Territory located in the South Atlantic Ocean and are on the cusp of hydrocarbons exploitation. There have been recent rounds of oil and gas exploration, and the inaugural field development is scheduled for sanction at the end of 2019.[17] As this deadline approaches, Premier Oil (PMO), the operator for the proposed Sea Lion Development have produced and submitted the first development ES in the Islands,

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[13] BEIS OPRED, '*The Offshore Petroleum Production and Pipelines (Assessment of Environmental Effects) Regulations 1999 (as amended) – A Guide'* (Rev 5 2019) <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 24 July 2019

[14] Environmental Impact Assessment Centre, '*Quality Review of Environmental Statements for Offshore Petroleum Production and Pipeline Developments'* (2007) Manchester University <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 22 March 2019 The results from this report were later published in a peer-reviewed paper: Adam Barker, Carys Jones, 'A Critique Of The Performance Of EIA Within The Offshore Oil And Gas Sector' (2013) 43 EIAR 31

[15] Geoffrey Maitland, '*Offshore oil and gas in the UK: an independent review of the regulatory regime*' ("The Maitland Review") (2011) which considered the findings from the official Macondo reports and relevance to UK oil and gas industry, and subsequent policy commitments from UK Government, '*Offshore oil and gas in the UK: Government response to an independent review of the regulatory regime (Maitland Review)*' (2012) 12D/366 <https://www.gov.uk/government/publications/government-response-to-an-independent-review-of-the-regulatory-regime> accessed 25 July 2019

[16] BEIS OPRED, '*The Offshore Petroleum Production and Pipelines (Assessment of Environmental Effects) Regulations 1999 (as amended) – A Guide'* (Rev 5 2019) <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 24 July 2019

[17] Premier Oil <http://www.premier-oil.com/operations/falkland-islands> accessed 27 Mar 2019

which has been accepted by the Falkland Islands Government (FIG).[18] Final approval will be considered by FIG alongside submission of the full Field Development Plan (FDP), which is anticipated in 2019. The FIG Department of Mineral Resources (DMR) is the local regulator, and ESs are considered against the requirements of the Offshore Minerals Ordinance (OMO), with specific EIA provisions most recently amended in 2011.[19] Relying on old legislation can create problems for environmental protection,[20] and FIG are currently in the process of updating their suite of offshore environmental regulations, moving towards a goal-setting regime.[21]

FIG policy is to adopt UK standards as the base level wherever there is a gap in legislation or regulation, [22] therefore this review will incorporate consideration of the recent Sea Lion ES alongside UK development ESs to see whether the quality is aligned. OPRED provide advice to FIG with regards to the environmental aspects of hydrocarbon regulation, and this dissertation aims to capture how the two institutions have effectively collaborated to ensure that the Sea Lion ES meets UK standards.

Regulatory separation is an important aspect of effective regulation. In the EU this was achieved by implementing the Offshore Safety Directive (Directive 2013/30/EU). Implementing this in the UK, the Health and Safety Executive (HSE) and OPRED now work closely together as a partnership Competent Authority under the Directive through a Memorandum of Understanding (MoU).[23] The health and safety and environmental protection components are therefore governed separately from licensing, which is dealt with by the Oil and Gas Authority.

A similar approach to the setting up a Competent Authority within FIG DMR has been undertaken, with proposals approved for the separate discharge of safety and environmental

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[18] Falkland Islands Government '*Sea Lion Development Environmental Impact Statement'* (2018) Executive Council Paper 180/18P <https://www.fig.gov.fk/assembly/public-papers/executive-council-papers/> accessed 30 March 2019

[19] Offshore Minerals Ordinance 1994 (as amended) SI 1994/16 VI 64-67A (Falkland Islands)

[20] Michelle Portman, 'Regulatory capture by default: Offshore exploratory drilling for oil and gas' (2014) 65 Ener Pol 37

[21] Falkland Islands Government "*Drafting Offshore Environmental Legislation*" (2018) Executive Council Paper 128/18P <https://www.fig.gov.fk/assembly/public-papers/executive-council-papers/> accessed 23rd July 2019

[22] Falkland Islands Government '*Drafting Offshore Environmental Legislation'* (2018) Executive Council Paper 128/18P <https://www.fig.gov.fk/assembly/public-papers/executive-council-papers/> accessed 30 March 2019

[23] HSE website <http://www.hse.gov.uk/osdr/authority/index.htm> accessed 23rd July 2019

functions in June 2019, following a period of adjustment within DMR.[24] A transparent approach for EIA review and consultation is integral to achieving good environmental governance, and the establishment of a clearly separated responsibility for environmental regulation contributes to ensuring accountability in decision making.

FIG contracted the Scottish Association of Marine Science (SAMS) Research Services Ltd. (SRSL)[25] to provide additional independent expert review for the Sea Lion ES, in the first instance providing a legislative compliance review, complemented by a full review of the document parallel to the statutory public consultation. The independent expert report utilised a modified Lee and Colley review package,[26] resulting in grading of the sections and subsections of the document as well as providing an overall quality grade.[27]

The output of the proposed review will build upon this and bring an additional layer of comparison between an established hydrocarbon industry (UK) and the fledgling development of the industry in the Falkland Islands.

3 EIA Review Package and Methodology

In 1992, Lee and Colley published a revised review package for ES following on from Colley 1989.[28] The occasional paper is laid out in two distinct sections; Part A essentially forming a literature review and describing the development and quality control of the process, and Part B which details the ES Review Package itself with amendments.

The paper states that 'The overall success of the EIA process depends, *inter alia*, on the quality of these statements' providing a clear rationale to regularly and systematically review ES documents and collate the results of such quality reviews. Evidence from earlier reviews,

[24] Falkland Islands Government '*Policy decision on various offshore minerals legislation matters'* (2019) Executive Council Paper 72/19P <https://www.fig.gov.fk/assembly/public-papers/executive-council-papers/> accessed 23rd July 2019

[25] Scottish Association of Marine Science Research Services Ltd. <https://www.srsl.com/> provides specialist marine consultancy and survey services, including reliable and robust environmental assessments

[26] Norman Lee, Raymond Colley, '*Reviewing the Quality of Environmental Statements'* (1992) OP 24 (2nd Ed) EIA Centre, University of Manchester, Manchester.

[27] Falkland Islands Government '*Sea Lion Development Environmental Impact Statement'* (2018) Executive Council Paper 180/18P <https://www.fig.gov.fk/assembly/public-papers/executive-council-papers/> accessed 30 March 2019

[28] Norman Lee, Raymond Colley, '*Reviewing the Quality of Environmental Statements'* (1992) OP 24 (2nd Ed) EIA Centre, University of Manchester, Manchester.

across countries and systems demonstrated that a significant proportion of ES fell below a satisfactory level.[29] The review package was primarily developed with regard to planning regulations in the UK that introduced environmental assessment in accordance with the original EIA Directive,[30] but are adaptable for other EIA systems and organisations in the UK and abroad. BEIS OPRED is the relevant regulatory authority and must determine whether an ES for a development or a stand-alone activity (e.g. the drilling of a well or laying a pipeline) is adequate and meets the requirements of the relevant legislation as described in Section 2.2. The self-contained review package has been designed as a tool for reviewers with a number of defined criteria in a hierarchical structure, as shown in Figure 1.

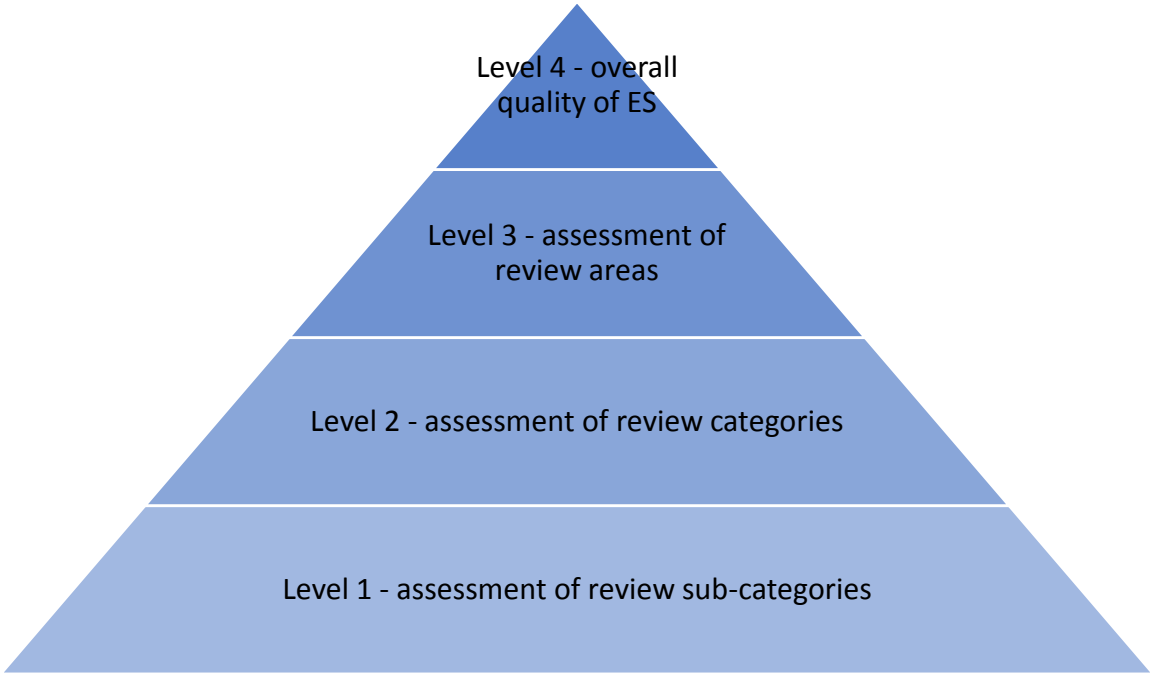

Figure 1 - The Assessment Pyramid, adapted from Lee and Colley[31]

'Letters' instead of 'numbers' are employed at each review level to dissuade composite numerical scores forming crude assessments (Table 1).

[29] Environmental Impact Assessment Centre, '*Quality Review of Environmental Statements for Offshore Petroleum Production and Pipeline Developments*' (2007) Manchester University <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 22 March 2019; Adam Barker, Carys Jones, 'A Critique Of The Performance Of EIA Within The Offshore Oil And Gas Sector' (2013) 43 EIAR 31; Urmila Jha-Thakur, Thomas B Fischer, '25 years of the UK EIA System: Strengths, weaknesses, opportunities and threats' (2016) EIAR 61, 19

[30] "The EIA Directive" Council Directive (EC) 2014/52/EU amended Directive 2011/92/EU which had codified the initial 1985 Council Directive (EC) 85/337 and three amendments in1997, 2003 and 2009. The original review package was developed against the 1985 EIA Directive

[31] Norman Lee, Raymond Colley, '*Reviewing the Quality of Environmental Statements*' (1992) OP 24 (2nd Ed) EIA Centre, University of Manchester, Manchester.

Symbol	Explanation
A	Relevant tasks well performed, no important tasks left incomplete.
B	Generally satisfactory and complete, only minor omissions and inadequacies.
C	Can be considered just satisfactory despite omissions and/or inadequacies.
D	Parts are well attempted but must, as a whole, be considered just unsatisfactory because of omissions or inadequacies.
E	Not satisfactory, significant omissions or inadequacies.
F	Very unsatisfactory, important task(s) poorly done or not attempted.
NA	Not applicable. The Review Topic is not applicable, or it is irrelevant in the context of this Statement.

Table 1 - List of Assessment Symbols as described by Lee and Colley 1992[32]

The review outcomes can be utilised to further inform decision makers regarding:

- Identifying additional information required;
- Identifying environmental aspects requiring a greater level of review; and/or
- Evaluating the likely environmental impacts.

The package can be deployed to determine the overall quality of ES across a defined period or industry, as is the situation for this dissertation. Lee and Colley conclude that the 'ultimate aim (is) to improve the quality of the EIA process as a whole'.[33]

The research objectives were described in the introductory chapter (see textbox below). The chosen methodology will allow for a direct comparison with the previous review results, whilst the checklist approach allows for confirmation of compliance with the updated EIA Regulations (implementing the revised EIA Directive). The results from the analysis will highlight differences in performance across the review areas and allow determination of overall quality as well as for the quality of specific subsections.

[32] Norman Lee, Raymond Colley, '*Reviewing the Quality of Environmental Statements*' (1992) OP 24 (2nd Ed) EIA Centre, University of Manchester, Manchester.

[33] Norman Lee, Raymond Colley, '*Reviewing the Quality of Environmental Statements*' (1992) OP 24 (2nd Ed) EIA Centre, University of Manchester, Manchester.

4 Analysis

The research was undertaken through the Making the Most of Masters (MMM) programme, in collaboration with OPRED and the University of Stirling.

The 2007 review commissioned by OPRED was conducted at a greater scale than can be achieved by this dissertation.[34] For example each ES was reviewed by two independent reviewers (as recommended by Lee and Colley) and, there was a dedicated project team. Out of necessity the scope of this review has therefore been limited to some extent. It is acknowledged that there is a risk of subjectivity if the ES review is conducted by a single reviewer.[35] However it is anticipated that this risk has been mitigated through the MMM scheme, obtaining expert advice and assistance from competent individuals with OPRED. Although the authors of the methodology employed recommended multiple reviewers to avoid subjectivity,[36] others, using the European Commission guidance package, have highlighted the difficulty of finding similar evaluations through multiple reviewers.[37]

The most significant changes to the EIA Regulations since the 2007 review by Manchester University EIA Centre are:

- Amendments to Schedule 2 (increased level of detail – see Appendix 2)
- Requirement for competent experts (as brought about by revised EIA Directive); and

[34] Environmental Impact Assessment Centre, '*Quality Review of Environmental Statements for Offshore Petroleum Production and Pipeline Developments'* (2007) Manchester University <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 22 March 2019 was commissioned by OPRED; BEIS OPRED, '*The Offshore Petroleum Production and Pipelines (Assessment of Environmental Effects) Regulations 1999 (as amended) – A Guide'* (Rev 5 2019) 14 <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 24 July 2019 section 1.4.2 notes that a further independent review was commissioned in 2017 (not yet taken place) which is likely to again be at a greater scale/scope than this dissertation.

[35] Kaja Peterson 'Quality of environmental impact statements and variability of scrutiny by reviewers' (2010) 30 EIAR 3 169

[36] Environmental Impact Assessment Centre, '*Quality Review of Environmental Statements for Offshore Petroleum Production and Pipeline Developments'* (2007) Manchester University <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 22 March 2019

[37] Stephanie Landim, Luis Sánchez, 'The contents and scope of environmental impact statements: how do they evolve over time?' (2012) 30 IAPA 4

- The incorporation of a summary of the risk assessments in relation to Major Accident Hazards (MAH) and Major Environmental Incidents (MEI) required by the Safety Case Regulations.[38]

Other legislative changes included amendments to consultation requirements[39] which take place after submission of the ES and as such do not directly influence the original quality and are not a focus of this review.

4.1 Sample selection

20 ESs were submitted to, and approved by, OPRED between May 2017 and May 2019. This total excludes ESs submitted for Production Increases. The study aimed to analyse 50% of these ES and the final sample size was 9 documents (45%), compared to the earlier review which sampled 35 ESs across a five year period (43% of available documents).[40] Sample documents were selected by mapping out the distribution of projects and then selection was based on geographical and operator distribution to try and spread samples across the UKCS and across a range of operators. The review only looked at a single ES per operator, although some had submitted multiple ES during the study period.

Document size ranged from 186-534 pages; Lee and Colley estimate an average 50-page ES takes ~3hrs to review, with reviews becoming faster as reviewer experience increases. For the selected sample, documents took an average of 10-14 hours for a preliminary review.

To try to reduce subjectivity and reviewer bias,[41] once preliminary grades had been assigned to each document they were discussed with the Environmental Manager (EM) who had

[38] The Offshore Installations (Offshore Safety Directive) (Safety Case etc.) Regulations 2015 SI 2015/398 implement the requirements of Council Directive 2013/30/EU on Safety of Offshore Oil and Gas Operations and amending Directive 2004/35/EC

[39] United Nations Economic Commission for Europe (UNECE) Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters ("The Aarhus Convention") adopted 25 June 1998, entered into force 30 October 2001 - it enshrines a number of rights of the public with regard to the environment, specifically for public authorities to make arrangements to enable the public and NGOs to comment on proposals for projects affecting the environment. This is implemented through Regulations 9 and 10 of The Offshore Petroleum Production and Pipe-lines (Assessment of Environmental Effects) Regulations 1999 SI 1999/360

[40] Environmental Impact Assessment Centre, '*Quality Review of Environmental Statements for Offshore Petroleum Production and Pipeline Developments'* (2007) Manchester University <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 22 March 2019

[41] Norman Lee, Raymond Colley '*Reviewing the Quality of Environmental Statements'* (1992) OP 24 (2nd Ed) EIA Centre, University of Manchester, Manchester; Kaja Peterson, 'Quality of environmental impact statements and variability of scrutiny by reviewers' (2010) EIAR 30, 3, 169

initially reviewed the ES submission and administered the consultation process, to determine whether their views were distinctly different regarding the gradings. Whilst this is not consistent with the earlier quality review in which two independent reviewers dealt with each document, there was insufficient time and resources to engage a second reviewer for each document. This caveat is highlighted here as it is a deviation from the accepted methodology proposed and utilised by the Manchester University EIA Centre.

The selected sample was considered representative of the documents submitted since the amended EIA Regulations implemented the changes as required by Directive 2014/92/EU. As well as the UK sample, an additional ES for a proposed field development in the Falkland Islands was considered against the same criteria and methodology to determine if it would satisfy UK regulations and if the quality was in line with that of UK developments.

Whilst overall sample size is too small to apply statistical interpretation, general findings can be considered against other ES reviews, specifically the previous review of offshore ESs published in 2007.

4.2 Quality review results

The amended review package that supports the methodology is available in Appendix 1.

This has not changed significantly from the 2007 review but the following amendments have been made; section 1.2.4 “number of workers/visitors” has been removed; section 4.1.2 adds a requirement to demonstrate competent experts; section 2.1.3 includes consideration of MAH/MEI (as introduced by the Safety Case Regulations)[42] as a demonstration of appropriate risk assessment (RA).

The documents reviewed were the ES documents on application and made available for public consultation. These documents do not incorporate any additional information that was submitted to OPRED following requests for more information. This is important as an individual ES, for example, may be reliant on study or survey results that have not yet been completed, which can influence the quality of the document at the time of submission.

[42] The Offshore Installations (Offshore Safety Directive) (Safety Case etc.) Regulations 2015 SI 2015/398 implement the requirements of Council Directive 2013/30/EU on Safety of Offshore Oil and Gas Operations and amending Directive 2004/35/EC

4.2.1 Overall ES Quality

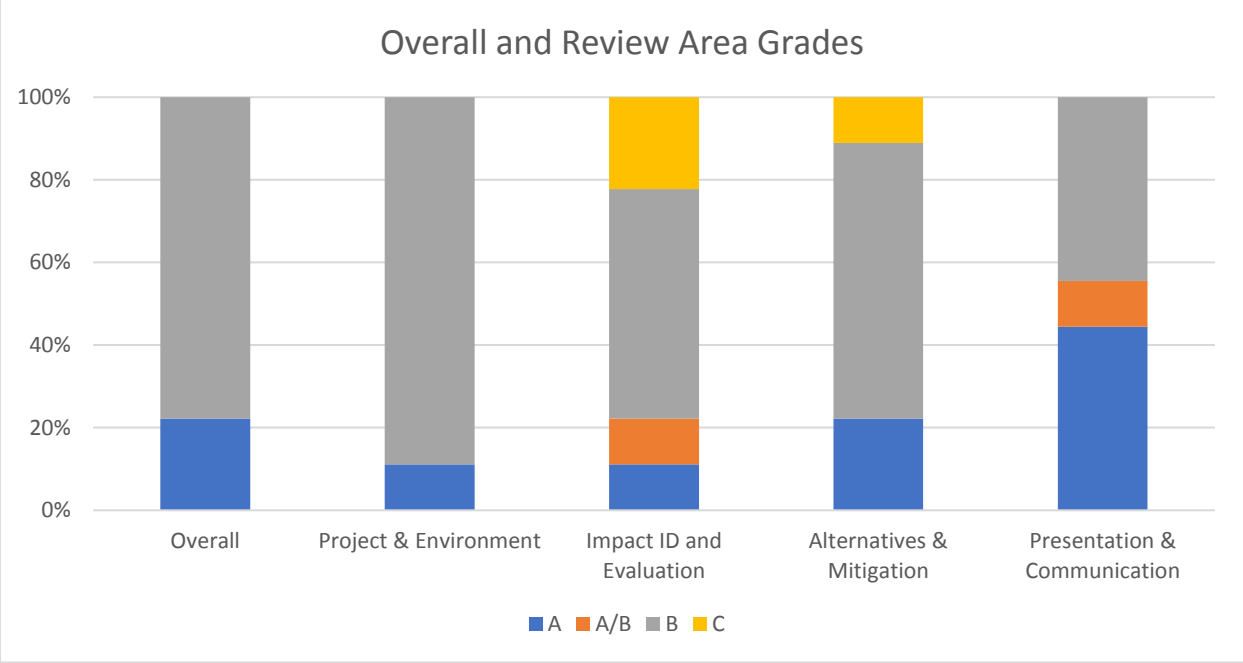

Figure 2 – Overall quality of sample ESs (n=9) and quality of each of the 4 review areas

The quality of all nine ES documents reviewed was above satisfactory, with two receiving grade A (22%), and the remaining 7 receiving grade B, a significant improvement since the earlier review where only 51% of sampled ESs achieved satisfactory grades (A-C)[43]. The four review areas demonstrate some differences as shown in Figure 2 with Presentation and Communication the highest scoring review area.

4.2.2 Quality of Review Areas

The four review areas were all performed well, with high gradings as described above. Closer analysis highlights areas of strengths and weaknesses.

Review Area 1 – Description of the project & the environment

[43] Environmental Impact Assessment Centre, '*Quality Review of Environmental Statements for Offshore Petroleum Production and Pipeline Developments*' (2007) Manchester University <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 22 March 2019

Project	Site	Waste & Emissions	Environment	Baseline

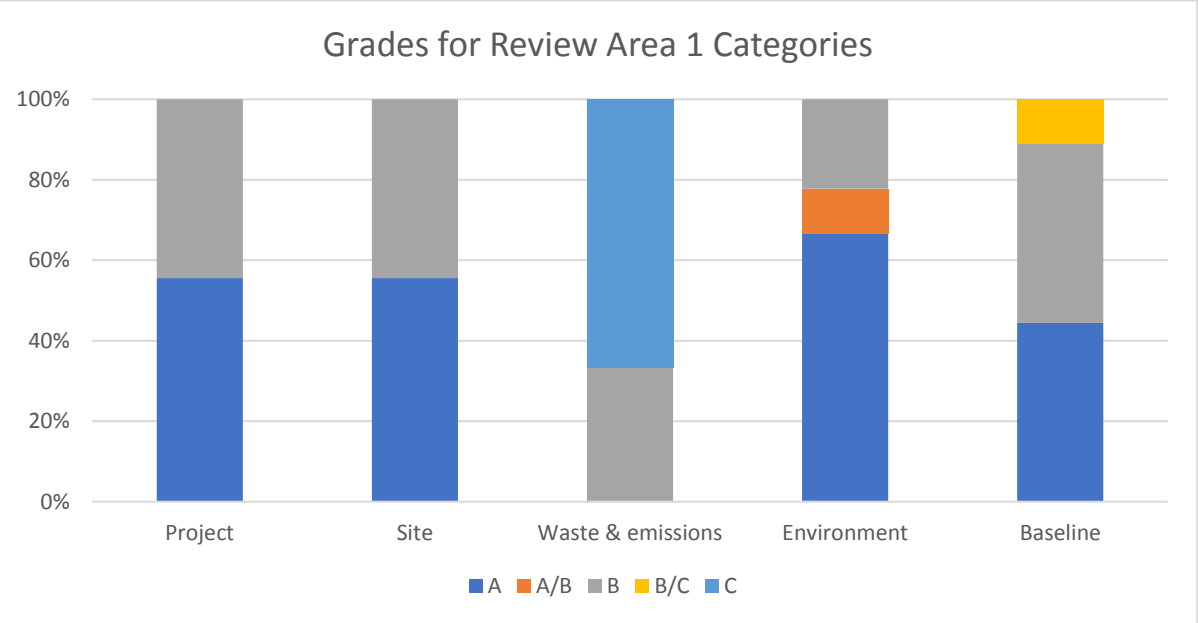

Figure 3 – Quality of review area 1 (Description of the project and the environment)

This review area focuses on the description of the proposed activities and the local environment where the proposed activities will take place. Overall, the description of the 'Project' and 'Site' were generally well performed. The 'Waste and emissions' category has a further subcategory within it regarding the nature and quantities of raw materials and waste, and this generally lacked detail of chemical use and discharge and waste management routes, which led to lower scorings. Chemical selection is dealt with through the later permitting stage as standard.[44] However, the EIA Regulations and guidance require estimates of chemical volumes[45] and this could have been improved in some ESs using previous experience to inform the project description. Whilst it is unlikely that the environmental impacts of waste or chemicals will be significant, these should still be dealt with through the ES as expected by the guidance and legislation or, if it is considered that these sections can be scoped out of the initial ES then the guidance should be amended to reflect this. The permitting process for chemicals (The Offshore Chemicals Regulations 2002, with applications submitted via the UK

[44] The Offshore Chemical Regulations 2002 UK SI 2002/1355 amended by The Offshore Chemicals (Amendment) Regulations 2011 UK SI 2011/982

[45] Schedule 2 of The Offshore Petroleum Production and Pipe-lines (Environmental Impact Assessment and other Miscellaneous Provisions) (Amendment) Regulations 2017 SI 2017/582; BEIS OPRED, '*The Offshore Petroleum Production and Pipelines (Assessment of Environmental Effects) Regulations 1999 (as amended) – A Guide*' (Rev 5 2019)

Energy Portal Environmental Tracking System (PETS)) and the control of waste (onshore waste disposal dealt with in Scotland by the Scottish Environmental Protection Agency (SEPA) and in England and Wales by the Environment Agency) aim to ensure that there are no significant environmental effects and additional checks and balances are in place post-ES.

'Environment' and 'Baseline' were generally performed well (67% A, 44% A respectively), reflecting the environmental understanding of impacts relating to a mature industry and the collection of strategic level baseline data as well as undertaking project specific studies to inform the assessments. The use of relevant marine plans and recent literature from a wide range of sources was noted. Overall, the 'Waste and emissions' category generally performed least well.

Review Area 2 – Impact identification and evaluation of key impacts				
Definition of impacts	Identification of impacts	Scoping	Prediction of impacts	Significant of impacts

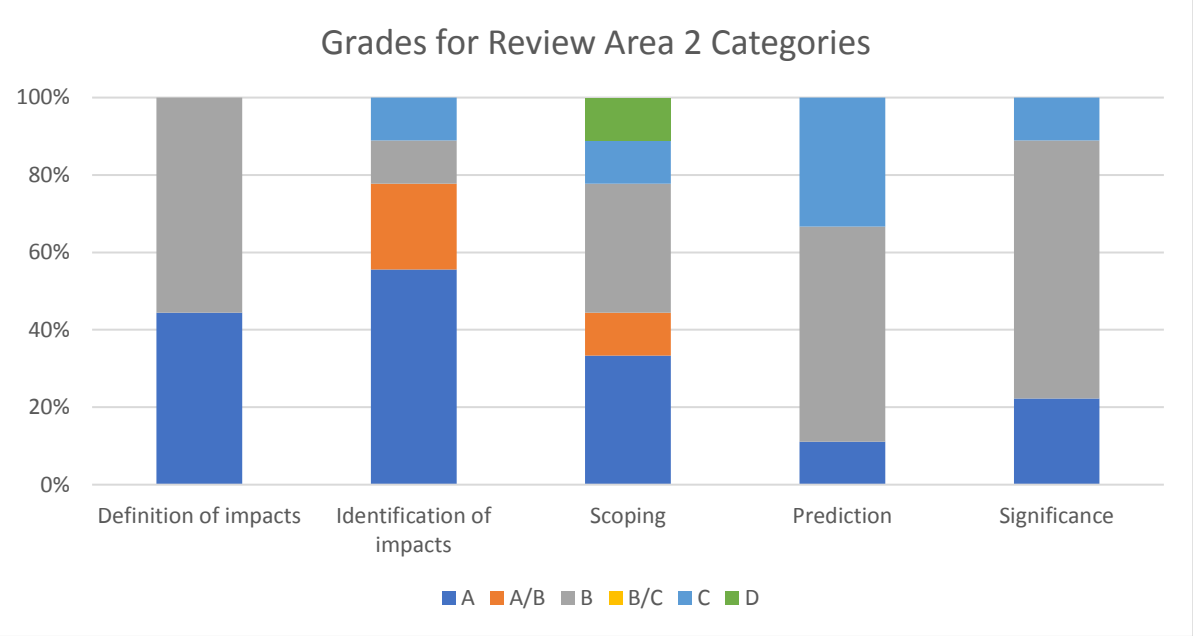

Figure 4 – Quality of Review Area 2 (Impact identification and evaluation of key impacts)

All the categories performed well. 'Definition of impacts' performed best with 100% of documents graded B or above. This improves on the 2007 best performance for definition of impacts, with only 86% of ESs achieving satisfactory grades between A-C. Prediction was comparatively the weakest, although all ESs were satisfactory, 33% were graded C.

'Scoping' was graded B or above for 77% of project proponents (the two lower gradings for this category were justified based on the content of the ES as scoping had taken place but it had not been adequately demonstrated in the document). An observation from the previous review was that scoping was often limited to a small, focussed set of stakeholders rather than the general public.[46] Whilst scoping in general has improved, the targeted stakeholders remain limited but given the very rare consultation responses from the wider public on any submitted ES, it is unlikely that wider public scoping would significantly improve the quality of documents.[47] Early engagement with OPRED is recommended in the guidelines,[48] and EMs suggest that for a number of operators this process has improved significantly over time. Full public consultation is the next stage of the ES review process and takes place post-submission of the ES.

Identifying and evaluating environmental impacts is based on Schedule 2 of the EIA Regulations;[49] the range of these impacts remains broadly the same as earlier iterations of the legislation but a greater level of detail is now specified (Appendix 2).

There have been improvements in the way that socio-economic impacts are incorporated in ES (i.e. other industries, Strategic Environmental Assessments,[50] Marine Plans, vessel traffic, cultural heritage). However, unlike the earlier review, there was insufficient time within this dissertation to focus on the way in which non-pollution effects were covered in detail.

Methodologies are a sub-category of the identification of impacts, and different operators/consultants presented different methodologies across the sample ESs. The ease of use of these varied significantly and the level of clear, transparent and logical assessments

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[46] Environmental Impact Assessment Centre, '*Quality Review of Environmental Statements for Offshore Petroleum Production and Pipeline Developments'* (Manchester University 2007) <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 22 March 2019.

[47] Personal communication with OPRED staff May-August 2019

[48] BEIS OPRED, '*The Offshore Petroleum Production and Pipelines (Assessment of Environmental Effects) Regulations 1999 (as amended) – A Guide*' (Rev 5 2019)

[49] Schedule 2 of The Offshore Petroleum Production and Pipe-lines (Environmental Impact Assessment and other Miscellaneous Provisions) (Amendment) Regulations 2017 SI 2017/582

[50] Strategic Environmental Assessments (SEA) are required by Directive 2001/42/EC on the Assessment of the Effects of Certain Plans and Programmes on the Environment and have been conducted for the offshore energy sector throughout UK waters as an 'upstream' form of environmental assessments at a strategic level. A concise and informative description of offshore SEA for the UK can be found in: Richard Caddell 'Unchartered Waters: Strategic Environmental Assessment in the UK Offshore Area' in Gregory Jones and Eloise Scotford (eds) *The Strategic Environmental Assessment Directive: A Plan for Success?* (Hart 2016)

differed, as did the ease of following how consistently the methodology had been applied (further discussed in 4.3.4).

Review Area 3 – Treatment of alternatives and mitigation		
Alternatives	Mitigation measures	Commitment to mitigation

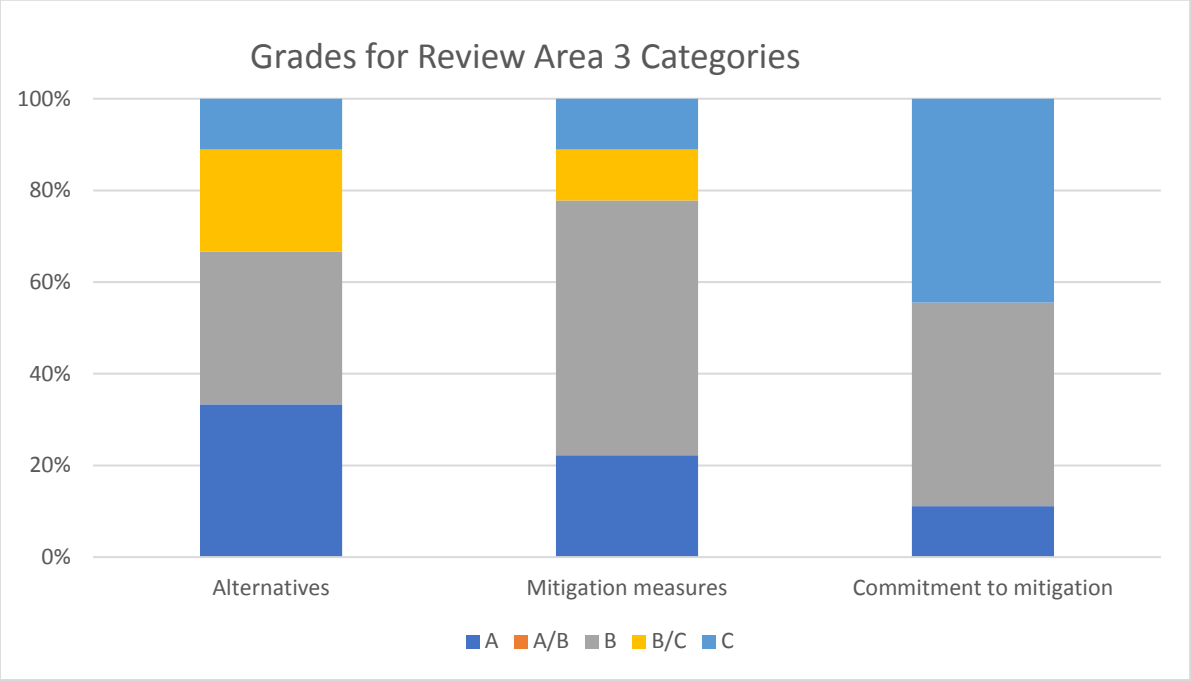

Figure 5 – Quality of review area 3 (treatment of alternatives and mitigation)

Treatment of alternatives has improved (it was previously the weakest category in this review area, with 59% achieving C or above), but at the ES stage of a proposed development there is still often a level of uncertainty with regard to the final project design/description and therefore often 'worst case' scenarios need to be assessed from a precautionary perspective. This could be improved by having a more defined project plan within the ES before submitting to the regulator. It is worth noting the consideration of alternatives often tends to be less about the environmental impacts than the technical and economic feasibility.

44% of the sample were graded C for 'Commitment to mitigation'. However, the grade was generally due to weak monitoring proposals. Despite 100% of the sample ESs describing their environmental management systems (EMSs) the link between the ES, the EMS and the environmental monitoring/management plan (EMP) also lacked detail and the cohesion between systems was found to be vague (described further in 4.3).

The 2007 review observed that whilst mitigation and monitoring are clearly interlinked with EMSs this integration was often substantially lacking,[51] leading to a requirement for EMS being incorporated in guidance documents in the following years[52]. ISO 14001 accredited EMS are noted in all sample ESs, and corporate HSE documents are reproduced as required, yet the integration of such proposals is often broad and remains an area that can be improved. The ISO 14000 series has demonstrated improvements in companies' cognizance of sustainable environmental priorities,[53] but only 11% of the sample ESs were able to establish how their accredited EMS directly correlated to ensuring effective commitment to mitigation and monitoring.

Review Area 4 – Communication and presentation of the information			
Layout	Presentation	Emphasis	Non-technical summary (NTS)

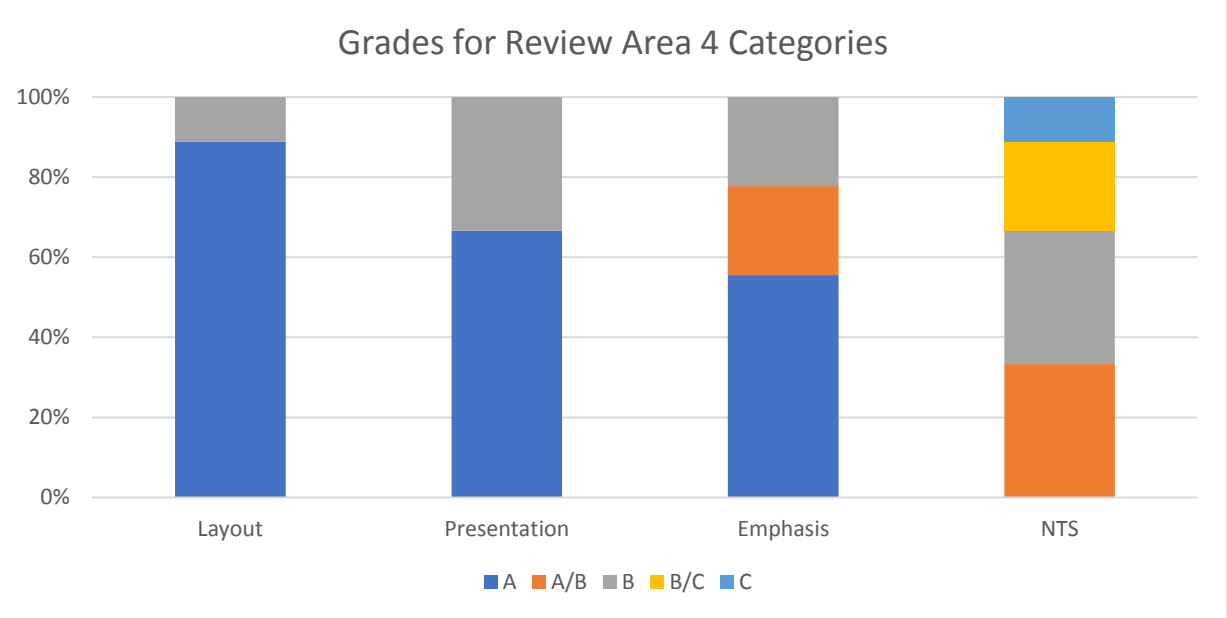

Figure 6 Quality of review area 4 (Presentation and communication of the information)

[51] Environmental Impact Assessment Centre, '*Quality Review of Environmental Statements for Offshore Petroleum Production and Pipeline Developments*' (Manchester University 2007) <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 22 March 2019.

[52] BEIS OPRED, '*The Offshore Petroleum Production and Pipelines (Assessment of Environmental Effects) Regulations 1999 (as amended) – A Guide*' (Rev 5 2019) <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 24 July 2019

[53] Adam Pawliczek, Radomir Piszczur, 'Effect of management systems ISO 9000 and ISO 14000 on enterprises' awareness of sustainability priorities' (2013) 16 E a M: Eknowie a Management 2

All categories within this area performed well, although demonstrating confidence in data within the NTS could be improved (as with the ES chapters in general). None of the NTS were graded A, this was due to lacking clearly structured and simplified summary tables of impacts and mitigation which would contribute to improved understanding for non-specialist audiences. General improvements to layout and presentation could be made by increasing visual aids such as short, colour coded summary tables for each assessment chapter and emboldening important text.

Proportionality become an interest when allocating scores relating to layout, presentation and emphasis given the range of document sizes and the balancing act between incorporating all relevant information in the main text and creating a very lengthy document; versus how much information can be placed in appendices. Some ESs achieved this balance successfully, whilst others failed to succinctly capture relevant text and assessment outcomes in the body of the ES. A relatively common attribute was to populate a detailed table conveying the full EIA process and locate this in an appendix without necessarily incorporating these simplified results within the relevant assessment chapters. Taking sections of this sort of table, along with a column for mitigation/commitment measures and adding it to each chapter would allow for a clear logical summary of each assessment.

4.2.3 Use of consultants

All sample ESs were concluded to have been prepared by competent experts. However, one ES received a lower grading in this area due to a failure to submit the standard (and required) cover sheet that details the competency and experience of the project team. In this case, the operator and consultant were both well-known and so compliance was deemed 'just satisfactory'.[54] It is standard practice for hydrocarbon operators to contract out the EIA process and preparation of the ES to environmental consultants who have access to a wealth of subject-specific expertise.

[54] Personal communication with OPRED staff May-August 2019

The relationships between consultants and operators, and the scope of work involved varies, subsequently leading to varying level of ownership of an ES by either party. Operators and consultants tend to have company standard formats and layouts, as well as standard risk assessment or impact assessment methodologies. Ultimately ownership of the ES lies with the operator and it is expected that they will have a full understanding of the EIA Regulation requirements. It is also pragmatic for them to be fully involved with the EIA process from the early stages through to quality assurance before ES submission.

Whilst a third of all UK ES are accredited with the IEMA Quality Mark,[55] only one ES in this sample contained the Quality Mark which may suggest scope for future standardisation.

4.3 Discussion

4.3.1 Strengths and weaknesses

The 2007 review ranked highest and lowest sub-categories by proportion of A+B grades. Given the improvements since then, this review ranked only by proportion of A grades to give highest and lowest performance of tasks (Table 2). The numbers indicated in brackets refer to a subsection of the methodology (Layout, Presentation and Environment remain as strengths with a high proportion of A grades. The requirement for a NTS does not appear to have been performed as competently as it didn't receive any A grades (as described earlier) but in general the quality of the NTS remains satisfactory. 'Commitment to mitigation' and 'mitigation measures' performed relatively poorly; as discussed in greater detail in section 4.3.5.

Table 2 - Best and worst performed sub-categories 2019 v 2007

	2019 Review results (n=9) Proportion of A grades	2007 Review Results (n=37) Proportion of A + B grades	
1	Layout (4.1) 89%	Presentation (4.2)	(Best)
2	Presentation (4.2) 67%	Layout (4.1)	
3	Environment (1.4) 67%	Environment (1.4)	
4	Project (1.1) 56%	Emphasis (4.3)	

[55] Alan Bond, Thomas B Fischer, Josh Fothergill, 'Progressing quality control in environmental impact assessment beyond legislative compliance: An evaluation of the IEMA EIA Quality Mark certification scheme' (2017) EIAR 63 160

5	Site (1.2) 56 %	Baseline (1.5)	
6	Identification of impacts (2.2) 56%	NTS (4.4)	
7	Emphasis (4.3) 56%		
	…….	…….	
12	Mitigation measures (3.2) 22%	Site (1.2)	
13	Significance (2.5) 22%	Identification of impacts (2.2)	
14	Commitment to mitigation (3.3) 11%	Commitment to mitigation (3.3)	
15	Prediction (2.4) 11%	Significance (2.5)	
16	NTS (4.4) 0%	Mitigation measures (3.2)	
17	Waste and emissions (1.3) 0%	Prediction (2.4)	(Worst)

4.3.2 Data

There are concerns raised by stakeholders regarding the age of data used to inform EIAs,[56] and the age and relevance could have been justified more clearly within several of the sample ESs. Current OPRED guidance states that the 'commonly adopted strategy of simply basing the description on familiar (and in some cases historic) references is unlikely to be acceptable and should be supported by more recent data obtained from in-house studies and more recent published work'.[57] Most ESs did contain site-specific studies for the development area, but a number of them had submitted the ES before the full results of such surveys or studies were available to be incorporated in the ES. The checklist-based methodology used in this study struggles to cope with the level of variability and detail contained within technical chapters (i.e. sound and ecology), which may justify targeted investigation into the data used to inform assessments.

Quality of baseline data and scientific understanding of the environment, alongside monitoring and feedback are essential components when determining significance in EIA

[56] Contained within ES sample documents, personal conversations with OPRED staff May-August 2019, formal consultation responses

[57] BEIS OPRED, '*The Offshore Petroleum Production and Pipelines (Assessment of Environmental Effects) Regulations 1999 (as amended) – A Guide'* (Rev 5 2019) <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 24 July 2019

(discussed further 4.3.4 and 4.3.5). The quality of the ecological component of onshore ES in England was investigated in 2015, and considerable data gaps were noted,[58] although some recommendations made in that analysis such as competency have already been incorporated into legislation and guidance. Context dependent chapter review criteria[59] for the offshore hydrocarbons industry could be developed, and further improvements to data standards could be achieved through regular review of ESs and supporting data, as well as active promotion of new research and guidance.

Requirements under the EIA Regulations include Schedule 2 (5)(b) 'Sustainability of resource use' and (f) 'impact on climate and vulnerability to climate change' which were both areas that rarely achieved grade A in this review.[60] Emissions reductions and alternatives were generally not demonstrated, and there was often a lack of data when describing the use and discharge of raw materials. This may be due to timing, as ESs can be submitted early in a development process, before the project description has been finalised (e.g. how a pipeline will be laid, the final route of a pipeline, the type of drilling rig whether anchored or dynamically positioned (DP)). Whilst operators take a precautionary approach to likely significant effects and select the worst-case options for assessment (as expected under legislation and advised in guidance) this level of uncertainty can make the ES overly complex as it may deal with multiple project options (e.g. worst case noise assessment for a DP rig as well as worst case benthic disturbance for an anchored rig). Reducing uncertainty by ensuring a greater level of project definition would allow ESs to be more succinct and accurate when predicting actual effects.

It is standard to not describe chemical use and discharge in any detail in the ES, including potential quantities, as these are dealt with later through the permitting system. This includes cement/concrete deposits and assessments could be improved based on previous experience when developing improved estimates. Cement discharges in particular may have a cumulative environmental impact as every well drilled will have some level of cement slurry discharged on a planned or unplanned basis, and more effort should be made to incorporate and/or improve these estimates. If the wider impact is not considered to be significant, then the

[58] Katherine Drayson, Graham Wood, Stewart Thompson, 'Assessing the quality of the ecological component of English Environmental Statements' (2015) 160 J Env Mngmnt

[59] Katherine Drayson, Graham Wood, Stewart Thompson, 'Assessing the quality of the ecological component of English Environmental Statements' (2015) 160 J Env Mngmnt

[60] The Offshore Petroleum Production and Pipe-lines (Environmental Impact Assessment and other Miscellaneous Provisions) (Amendment) Regulations 2017 SI 2017/582;

requirement for cement estimates and impact assessment could be removed from the guidance documents.

The annual environment report prepared by the industry body Oil and Gas UK (OGUK) concludes that carbon emissions and environmental discharges are, in general, reducing due to efficiency measures being implemented for both processes and offshore equipment.[61] For example, the industry contributed approximately 3% (14.65m tonnes) of the UK's greenhouse gas emissions in 2018 due to increased efficiency,[62] and the use of best available techniques and technology is expected to continue to improve environmental performance and in particular emission reductions year on year in line with net-zero targets.[63]

Despite such improvements, anecdotal evidence from informal discussions with EMs suggests that some operators are achieving the minimum standard required rather than being proactive to improve environmental performance through proposing additional mitigation or adhering to more stringent standards. Going above and beyond legislative and regulatory requirements particularly in well developed areas receives understandably less interest from stakeholders than in new or sensitive areas. Of the ESs reviewed, there was notably more scrutiny from stakeholders where a project interacted with sensitive areas or crossed the maritime-terrestrial boundary.

4.3.3 Scoping and consultation

Informal scoping is not a legislative requirement but is recommended in section 3.1.5.1 of the BEIS regulatory guidelines[64] and was assessed through section 2.3 of the checklist (Appendix 1). Incorporating a scoping stage with interested parties tends to follow impact identification

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[61] OGUK '*Environment Report 2019*' <https://oilandgasuk.co.uk/wp-content/uploads/2019/07/Environment-Report-2019.pdf> accessed 24th July 2019 The UK Oil and Gas Industry Association Ltd (OGUK)

[62] OGUK '*Environment Report 2019*' <https://oilandgasuk.co.uk/wp-content/uploads/2019/07/Environment-Report-2019.pdf> accessed 24th July 2019 The UK Oil and Gas Industry Association Ltd (OGUK)

[63] Committee on Climate Change '*Net Zero: The UK's contribution to stopping global warming*' (2019) UK Government <https://www.theccc.org.uk/wp-content/uploads/2019/05/Net-Zero-The-UKs-contribution-to-stopping-global-warming.pdf> accessed 16 June 2019 – the strategy by which the UK intends to achieve net-zero greenhouse gas emissions by 2050 in England and Wales and by 2045 in Scotland, reflected in the amended Climate Change Act 2008

[64] BEIS OPRED, '*The Offshore Petroleum Production and Pipelines (Assessment of Environmental Effects) Regulations 1999 (as amended) – A Guide*' (Rev 5 2019) <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 24 July 2019

(Environmental Impact Identification or ENVIID) and is a valuable tool in improving the quality of ESs by allowing early incorporation of stakeholder comments which can identify potential difficulties or sensitivities before the ES is prepared. The sample demonstrated that scoping has improved since the previous review (77% of the sample received A or B), and the single ES that received a D did so after failing to describe the scoping stage.[65]

A participatory approach is an important part of EIA, and public consultation requirements (post-submission) are set out in the legislation in compliance with the Aarhus Convention.[66] "Meaningful" and "sufficient" public participation has been highlighted by researchers as important for justice in decision making and is acknowledged by practitioners as an important component of the EIA system.[67] Public participation can be restricted to the consultation phase of the EIA process, but early engagement through a scoping phase improves transparency. The sample ESs demonstrated that scoping allows for significant impacts or areas of stakeholder concern to be incorporated relatively early on in a project, as well as allowing for 'scoping out' to achieve appropriate focus on significant effects in some instances. However, as has been described in the literature, scoping procedures have been criticised for failing to narrow the focus of the assessment sufficiently, leading to very lengthy documents and raising concerns about proportionality.[68] Some operators appear to be "hedging their bets" opting for a number of 'worst case scenarios' and alternatives within their ES before the project has been fully defined. This does meet the legislative requirements as it uses a precautionary approach, but the likely significant effects may be difficult to identify depending on the options involved. It may be better practice to submit the ES later, once the project has

[65] After discussion with the EM it was confirmed that scoping had taken place, and there was reference in the appendices, but there was no clear demonstration of the scoping or how comments had been incorporated.

[66] United Nations Economic Commission for Europe (UNECE) Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters ("The Aarhus Convention") adopted 25 June 1998, entered into force 30 October 2001 - it enshrines a number of rights of the public with regard to the environment, specifically for public authorities to make arrangements to enable the public and NGOs to comment on proposals for projects affecting the environment. This is implemented through Regulations 9 and 10 of The Offshore Petroleum Production and Pipe-lines (Assessment of Environmental Effects) Regulations 1999 SI 1999/360

[67] Nicholas Simpson, Claudia Basta, 'Sufficiently capable for effective participation in environmental impact assessment?' (2018) 70 EIAR; Eva Hansen, Graham Wood, 'Understanding EIA scoping in practice: A pragmatist interpretation of effectiveness' (2016) 58 EIAR

[68] Eva Hansen, Graham Wood, 'Understanding EIA scoping in practice: A pragmatist interpretation of effectiveness' (2016) 58 EIAR; German Marine Rivero, Ludmila Alves de Brito, Alberto Fonseco, 'Does size matter? An evaluation of length and proportion of information in environmental impact statements' (2018) 73 EIAR

been defined in more detail. This would allow for more focussed assessment, although it is recognised that in practice the timing of submissions is under pressure from wider constraints and later submission may not always be realistic (e.g. operator executive boards may require an approved ES before committing to fund a project).

Section 4.3 of the methodology (Appendix 1) states that 'information should be presented without bias and receive the emphasis appropriate to its importance in the context of the ES', there did not appear to be any undue level of bias,[69] although the level of subjectivity with regard to significance (see 4.3.4) may hold some inherent bias with regards to interpretation.

4.3.4 Methodology

There is no requirement to follow a standard or recommended methodology within the BEIS guidance beyond that the layout should be clear and logical, and that the methods used should be clearly described.[70] This allows different operators and environmental consultants to apply different methodologies that vary in both their clarity of process and application, increasing the potential for innovation, but reducing standardisation and making it more difficult to compare projects.[71] Of the ES sampled, one document was outstanding for its clear, concise and transparently applied methodology. This ES carried the IEMA quality mark and applied the IEMA methodology, accompanied with appropriate language, definitions, signposting and summary tables throughout that made it stand out for accessibility.

'Significance' is the cornerstone for EIA, although it remains undefined in the legislation,[72] and identifying the likely significant effects of a proposed development is an integral part of EIA. Given the undefined nature of significance, this leads to subjectivity in assessments, and there may be a requirement for an agreed transparent approach and collective agreement on the

[69] Álvaro Enríquez-de-Salamanca, 'Stakeholders manipulation of Environmental Impact Assessment' (2018) 68 EIAR

[70] BEIS OPRED, '*The Offshore Petroleum Production and Pipelines (Assessment of Environmental Effects) Regulations 1999 (as amended) – A Guide*' (Rev 5 2019) <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 24 July 2019

[71] Sam Briggs, Malcolm Hudson, 'Determination of significance in Ecological Impact Assessment: Past change. Current practice and future improvements' (2013) 38 EIAR 16

[72] Sam Briggs, Malcolm Hudson, 'Determination of significance in Ecological Impact Assessment: Past change. Current practice and future improvements' (2013) 38 EIAR 16

level of significance based on measurable changes to the environment (i.e. agreed methodologies).

Liaison with government departments and statutory consultees to discuss what constitutes a significant effect is important, as well as describing how impact prediction was undertaken and justified (i.e. magnitude of the effect x sensitivity of the receptor). This relates to scoping as already described (4.3.3) as well as to the final presentation of the assessment when considering the overall quality.

There are areas where significance thresholds that are based on available scientific evidence will inevitably take a precautionary approach (i.e. noise and oil spill modelling) but there will always be some disagreement[73] on what constitutes 'significant' and how precautionary that approach needs to be. Quality and quantity of scientific evidence has been found to be 'the greatest limiting factor when determining significance' and improving guidance has been a great driver of change.[74]

Assessment of cumulative impacts varied across operators, with some good attempts at incorporating cumulative impacts and others appearing to pay "lip service" to this requirement. The BEIS guidance refers to earlier (1999) EU guidelines for cumulative assessment, but these were not referenced in any of the ESs. There is a project proposal to determine a cumulative impact assessment methodology through the wider UKCS SEA programme and the University of Aberdeen,[75] which should bring benefits for assessing the impacts of offshore industries. Effective principles have been proposed for marine cumulative impacts, including a 6-step framework that incorporates assumptions, uncertainties and level of confidence in the assessments.[76] These do not appear to have been adopted into hydrocarbon ESs yet, although they offer a systematic procedure for operators and regulators to utilise, with the potential for standardisation of the methodology across industries.

Satisfactory assessment of cumulative effects is a recognised issue in environmental assessment and management, and Ellis *et al*. note that "many EMPs do not adequately assess

[73] Personal communication with OPRED staff May-August 2019

[74] Sam Briggs, Malcolm Hudson, 'Determination of significance in Ecological Impact Assessment: Past change. Current practice and future improvements' (2013) 38 EIAR 16

[75] Personal communication with OPRED staff May-August 2019

[76] Adrian Judd, Thomas Backhaus, Freya Goodsir, 'An effective set of principles for practical implementation of marine cumulative effects assessment' (2015) 54 Env Sci & Pol

cumulative impacts representing a gap across many jurisdictions". [77] The cumulative assessment of impacts of multiple wells and developments, and the connectivity and recovery dynamics at varying disturbance levels, continue to attract research (e.g. noise assessments) at an international level, even in the context of well-established oil and gas areas such as the UK and New Zealand.[78]

4.3.5 Monitoring and mitigation / EMS

'Appropriate monitoring' was regularly dealt with in the sample ESs by simply stating "will be included in the EMP", and this is not in line with legislation or BEIS guidance.[79] There was generally insufficient detail of proposed monitoring and how it would be incorporated into validation of the impact assessment, along with a dearth of information regarding the effectiveness of proposed mitigation or monitoring measures. The BEIS guidance requires that "Developers should indicate how they intend to monitor commitments to ensure compliance',[80] allowing readers/reviewers to understand how this process is integrated with EMSs and/or EMPs, and developers should also provide an overview of how any change process will be accounted for. All operators in the UKCS have a form of "plan-do-check-act" model within their corporate EMS which is generally stated within ESs when replicating their HSE policy, often with accompanying diagrams. However, there is a fundamental missing step where most ESs fail to demonstrate how their HSE policy or EMS will be applied to their environmental commitments. Section 3.3.3 of the Lee and Colley checklist (Appendix 1) requires mitigation and monitoring proposals implemented through EMS should be "fully described and adequate for the purpose",[81] which was generally lacking in the sample ESs.

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[77] Joanne Ellis *et al*, 'Environmental management frameworks for offshore mining: the New Zealand approach' (2017) 84 Mar Pol

[78] Joanne Ellis *et al*, 'Environmental management frameworks for offshore mining: the New Zealand approach' (2017) 84 Mar Pol

[79] BEIS OPRED, '*The Offshore Petroleum Production and Pipelines (Assessment of Environmental Effects) Regulations 1999 (as amended) – A Guide'* (Rev 5 2019) <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 24 July 2019

[80] BEIS OPRED, '*The Offshore Petroleum Production and Pipelines (Assessment of Environmental Effects) Regulations 1999 (as amended) – A Guide'* (Rev 5 2019) <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 24 July 2019

[81] Lee & Colley Review package (as amended) Section 3.3.3 "Where mitigation and monitoring proposals are to be implemented through integration into management plans or an Environmental Management System, these should

EMPs for the oil and gas sector often focus on the impact of produced water, drill cuttings and drilling fluid discharges on benthic sediment and water quality, following established protocols and sampling designs.[82] New techniques such as metabarcoding have been shown to be effective for benthic community assessments in New Zealand, demonstrating improvements in science and technology that could be utilised in the UK.[83] Receptors such as seabirds and marine mammals are difficult to monitor, and tend to rely on regional research and monitoring systems. The relatively low level of direct impacts of a single development or activity could still contribute to cumulative and long-term impacts across wider marine areas, but is an unreasonable level of commitment and expenditure for a single operator or developer to undertake monitoring and this sort of work relies on collaboration and cooperation to target research at priority areas.

Activity management, such as prohibiting the use and discharge of oil based muds (OBMs), restricting the types of toxic chemicals that can be discharged, and conditions requiring "soft start" procedures for seismic activities,[84] is a form of environmental management that has become standard in the UK and continues to improve.[85] Temporal restrictions can also be addressed through EMPs (avoiding sensitive time of year such as breeding or migration periods), whilst spatial restrictions (i.e. exclusion zones or avoiding the disturbance of sensitive habitat types) generally need to be addressed much earlier in SEA and EIA processes.[86]

All ES documents reviewed were submitted by operators that were ISO14001 accredited, and the importance of reaching these standards and implementing an EMS has been promoted by

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be fully described and adequate for the purpose. The corporate health, safety and environment policy should be reproduced."

[82] Sample ES documents; Joanne Ellis *et al*, 'Environmental management frameworks for offshore mining: the New Zealand approach' (2017) 84 Mar Pol

[83] Joanne Ellis *et al*, 'Environmental management frameworks for offshore mining: the New Zealand approach' (2017) 84 Mar Pol

[84] JNCC '*Guidelines for minimising the risk of injury to marine mammals from geophysical surveys*' (2017) Joint Nature Conservation Committee (JNCC) <http://archive.jncc.gov.uk/marine/seismic_survey> accessed 25 July 2019

[85] Erik Cordes *et al,* 'Environmental Impacts of the Deep-Water Oil and Gas Industry: A Review to Guide Management Strategies' (2016) 4 Frontiers Env Sci 58

[86] Erik Cordes *et al,* 'Environmental Impacts of the Deep-Water Oil and Gas Industry: A Review to Guide Management Strategies' (2016) 4 Frontiers Env Sci 58

a number of researchers.[87] "The overall objective of an EMP is to provide a continuous link or 'bridge' between the EIA process pre-consent and the EMS operated by various stakeholders" and a frequent shortcoming of the EIA process is insufficient implementation of follow-up measures[88] which is supported by the findings of this review. Previous studies have suggested formal guidelines should be produced that target explanations of how EMS can be implemented into EMP, [89] recognising that there is a gap in developing effective measures of performance and improvement.[90] Such guidance may encourage operators to consider existing mitigation measures and environmental commitments within their ESs but with greater clarity on the EMS interface and how their EMP will work to promote wider performance reporting in a more holistic way. Follow-up of commitments made, and conditions imposed by regulators, is important for ensuring effectiveness beyond the quality of an ES and to understand how commitments are adhered to post-project approval.[91]

4.3.6 Falkland Islands ES

The single ES for the Falkland Islands development performed well, but it has not been included within the overall assessment as that was designed to allow direct comparison with the earlier UK review. Incorporating the FI ES within this review was nevertheless appropriate as it was expected to conform to UK standards. It is encouraging for FI regulators to know that the quality standard is at least equivalent, and at the higher end of the average UK scores.

There are differences driving quality between the jurisdictions such as the remote location of the Falkland Islands, the infancy of the industry, and the level of interest in the project from local non-governmental organisations (NGOs). This level of interest created additional pressure regarding stakeholder engagement, which is reflected in the ES. The FI ES performed

[87] David Walker, Michael Pitt, Urmila Jha Thakur, 'Environmental management systems: Information management and corporate responsibility' (2007) 5 J Fac Mngmt 1

[88] Sophie Bennet, Simon Kemp, Malcolm D Hudson, 'Stakeholder perceptions on Environmental management Plans as an environmental protection tool for major developments in the UK' (2016) 56 EIAR

[89] Sophie Bennet, Simon Kemp, Malcolm D Hudson, 'Stakeholder perceptions on Environmental management Plans as an environmental protection tool for major developments in the UK' (2016) 56 EIAR

[90] David Walker, Michael Pitt, Urmila Jha Thakur, 'Environmental management systems: Information management and corporate responsibility' (2007) 5 J Fac Mngmt 1

[91] Angus Morrison-Saunders, Ross Marshall, Jos Arts, *EIA Follow-Up. International Best Practice Principles. Special Publication Series No.6* (Fargo USA 2007) International Association for Impact Assessment

better than the UK sample in some areas, due to local policy and pressure from stakeholders for increased information at this early stage in the project (in areas such as waste management, oil spill response, mitigation and monitoring). The ES also clearly incorporated sections that laid out the justification and 'confidence in data'.

Schedule 2(7) of the UK EIA Regulations requires 'a description of the main measures to avoid, reduce and, if possible, offset any major adverse effects that have been identified'. Offsetting has not been utilised in any UK offshore oil and gas ES to date but features in the FI ES with commitments to contribute offsetting payments. A draft EMP for the FI ES was incorporated as part of the submitted document, allowing consultees to gain further understanding of the proposed mitigation measures and how they related to identified potential impacts. Commitments made were at a greater level of detail then generally shown in the UK ESs and distinguished between industry standard and project specific measures (although arguably there were some mitigation measures proposed that were stated as project specific but could be considered industry standard). For this reason, for review area 3 (treatment of alternatives and mitigation) the FI ES performed better than most of the UK ESs.

Some areas of the FI ES, particularly relating to baseline data and the age of the data, influenced the grading in those areas, and the FI ES did not necessarily perform as well as some of the UK documents, but it still did not fall below acceptable UK standards. The determination of significance was in line with average UK documents, but was also an area that did not perform as well as the best ESs in the UK sample.

5 Conclusion and recommendations

Returning to the aims and objectives outlined at the beginning of this study, this analysis shows that the quality of UK ESs has advanced since 2005. All ESs reviewed met the minimum legislative requirements and all were graded as satisfactory or above for overall quality, demonstrating procedural effectiveness beyond basic legal compliance.[92]

[92] Barry Sadler, "*International Study of the Effectiveness of Environmental Assessment. Environmental Assessment in a changing world: Evaluating practice to improve performance*' [1996] Canadian Environmental Assessment Agency

This contributes to the body of literature regarding quality of offshore oil and gas ES, comparing with earlier review findings and analysing recent legislative and regulatory changes in the UK hydrocarbons industry.[93] The trend of improvement began after the earlier review,[94] and there have been numerous changes to guidance, policy and regulations since then; consequences of environmental catastrophes such as Macondo, and more stringent regimes coming into force through the EIA and Safety Case Directives.[95] There is a gap in quality review of offshore ES during this period but given the relatively limited revisions in the revised EIA Directive and subsequent transpositions into the EIA Regulations (see Appendix 2 for comparison of Schedule 2 requirements), combined with anecdotal evidence from OPRED staff, the direction of travel for ES quality has been positive.

This investigation had practical limitations due to time available, and the sample size was small but is considered representative. The study builds upon previous research, adding to the understanding of ES quality whilst highlighting areas that could be improved upon in future. These results inform regulators and decision makers, improving knowledge of the EIA process and the content of the final ESs.

Eight recommendations are suggested to continue improving ES quality:

1. **Increase details of chemical, waste, atmospheric emissions:** Improved estimates of these areas would be advantageous. Currently these areas are dealt with through permitting (EU ETS, PETS etc) but in line with the legislation there should be clearer estimates and descriptions of amounts described in the ES. Alternatives should be more explicit regarding environmental impacts rather than biased towards technical and economic advantages.
2. **Enhance clarity of methodologies:** OPRED should work with operators regarding their methodologies to ensure clear logical assessments and transparency of approach. Increased standardisation is an option but may reduce innovation and flexibility of approach.

[93] Adam Barker Carys Jones, 'A Critique Of The Performance Of EIA Within The Offshore Oil And Gas Sector' (2013) 43 EIAR 31

[94] Environmental Impact Assessment Centre, '*Quality Review of Environmental Statements for Offshore Petroleum Production and Pipeline Developments*' (2007) Manchester University <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 22 March 2019

[95] Council Directive (EC) 2014/52/EU; Council Directive (EC) 2013/30/EU

3. **Increase integration of EMP/EMS:** Mitigation and commitments should be integrated with EMP/EMS; the ES should demonstrate this and justify the effectiveness of any mitigation measures. Regular ES quality reviews can demonstrate the substantive effectiveness of the EIA process but follow up through monitoring, evaluation, management and communication of results is important to ensure that commitments made within ESs are undertaken, particularly where conditions have been imposed by the regulator.[96]
4. **Promote project definition through option selection:** Incorporating all relevant data and defining the project as fully as possible with regards to the submission timeline, building on the existing early discussions with OPRED. Describing the option selected (defined project) and environmental consequences, rather than covering several possible options and the associated worst-case scenarios will reduce uncertainty. Ensuring studies and samples are incorporated, so consultees have all relevant information in the consolidated ES as submitted. Discourage using the additional information process to incorporate results from project-specific studies.
5. **Improve incorporation of uncertainty:** Confidence in data and assessment could be made more explicit as demonstrated by the higher graded ESs, this should become standard in all ES submissions. Further investigation of baseline data may contribute to the confidence in assessment based on age and type of data. Active promotion of new research and guidance may help prevent over reliance on historical data.
6. **Consider adoption of marine cumulative impact assessment principles:**[97] Consult with industry regarding whether these principles can be effectively implemented, followed by incorporation into OPRED Guidance if appropriate.
7. **Develop chapter review criteria:** Review criteria specific to offshore oil and gas ES technical chapters (i.e. noise, baseline data) could be built into or alongside the Lee & Colley checklist to allow more in-depth analysis for future quality reviews.

[96] Angus Morrison-Saunders, Ross Marshall, Jos Arts, *EIA Follow-Up. International Best Practice Principles. Special Publication Series No.6* (Fargo USA 2007) International Association for Impact Assessment

[97] Adrian Judd, Thomas Backhaus, Freya Goodsir, 'An effective set of principles for practical implementation of marine cumulative effects assessment' (2015) 54 Env Sci & Pol

8. **Regular ES Quality Reviews:** OPRED has committed to regular reviews of ES quality. It has been more than 10 years since the last review and an increase in review frequency would allow better understanding of trends.

The proposed recommendations aim to ensure continued improvement in offshore oil and gas ES in the UK, in line with the requirements of the EIA Regulations as borne out of the EIA Directive. Whilst as ESs are compliant with the legislation and of satisfactory quality or above, this review has demonstrated some areas of relative weakness that can be the focus for improving ES quality in future.

Appendix 1

Amended Review Package

(This review package is taken directly from the Environmental Impact Centre report.[98] Highlighted text denotes new/amended text for this project, the italicised sections were amended in the 2007 review to ensure the review package was appropriate for the oil and gas industry).

"LIST OF REVIEW TOPICS
This is a list of hierarchically arranged topics for reviewing the quality of environmental statements submitted in response to UK regulations implementing Directive 2011/92/EU as amended by 2014/52/EU.

There are four areas for review.
1. Description of the development, the local environment and the baseline conditions.
2. Identification and evaluation of key impacts.
3. Alternatives and mitigation of impacts.
4. Communication of results.

In each of these areas there are several categories of activity which must be completed if the area is to be dealt with in a satisfactory manner. Similarly, each Category contains several Sub-categories. Below is a list of these topics arranged in a hierarchy. Review Areas are designated by a single digit, e.g. 1.; within these are Review Categories, designated by two digits, e.g. 1.1; and within each Review Category are Review Sub-categories, designated by three digits, e.g. 1.1.1.

1. DESCRIPTION OF THE DEVELOPMENT, THE LOCAL ENVIRONMENT AND THE BASELINE CONDITIONS
1.1 Description of the development: The purpose(s) of the development should be described as should the physical characteristics, scale and design *of all its elements and its relationship with associated developments*. Quantities of materials needed during construction and operation should be included and, where appropriate, a description of the production processes.

1.1.1 The ***ownership***, purpose(s) and objectives of the development should be explained together ***with its relationship to associated developments. An indication should be provided of the relevant industry experience of the project operator***.

1.1.2 The design and size of the development should be described. Diagrams, plans or maps will usually be necessary for this purpose.

1.1.3 There should be some indication of the physical presence and appearance of the completed development within the receiving environment.

1.1.4 Where appropriate, the nature of the production processes intended to be employed in the completed development should be described with the expected rate of production ***and any appropriate legislative and/or licensing requirements governing those processes***.

1.1.5 The nature and quantities of raw materials needed during both the construction and operational phases should be described.

1.2 Site description: The on site land requirements of the developments should be described and the duration of each land use.

1.2.1 The ***location and extent*** of the development should be defined and clearly shown on a map. ***Appropriate sector/block numbers should be specified***.

[98] Environmental Impact Assessment Centre, '*Quality Review of Environmental Statements for Offshore Petroleum Production and Pipeline Developments*' (2007) Manchester University <https://www.gov.uk/guidance/oil-and-gas-offshore-environmental-legislation> accessed 22 March 2019

1.2.2 ***Any*** uses to which ***both surface and seabed*** will be put should be described and the different ***areas of use*** demarcated ***on a scaled map/diagram.***

1.2.3 The estimated duration of the construction phase, operational phase and, where appropriate, decommissioning phase should be given.

1.2.4 ~~The numbers of workers and/or visitors ***to the*** site during both construction and operation should be estimated.~~ Their access to the site and likely means of transport should be given.

1.2.5 The means of transporting raw materials and products to and from the site and the approximate quantities involved, should be described. *Heli ops/vessel movements.*

1.3 Wastes *and emissions*: The types and quantities of wastes *and emissions* which might be produced should be estimated, and the proposed disposal routes to the environment described.

[NB: ***this*** includes all residual process materials and effluents. Waste energy, waste heat, noise etc, should also be considered.]

1.3.1 The types and quantities of waste matter, energy and other residual materials, and the rate at which these will be produced, should be estimated.

1.3.2 The ways in which it is proposed to handle and/or treat these wastes and residuals should be indicated, together with the routes by which they will eventually be disposed of to the environment.

1.3.3 The methods by which the quantities of residuals and wastes were obtained should be indicated. If there is uncertainty this should be acknowledged, and ranges of confidence limits given where possible.

1.4 Environment description: The area and location of the environment likely to be affected by the development proposals should be described.

1.4.1 The environment, ***including that of the seabed***, expected to be affected by the development ***and any associated pipeline corridors*** should be indicated with the aid of a suitable map of the area.

1.4.2 The affected environment should be defined broadly enough to include any potentially significant effects occurring away from the immediate construction site. These may be caused by, for example, the dispersion of pollutants, infrastructural requirements of the project, ***air and sea*** traffic, etc.

1.5 Baseline conditions: A description of the affected environment as it is currently, and as it could be expected to develop if the project were not to proceed, should be presented.

1.5.1 The important components of the affected environments should be identified and described. The methods and investigations undertaken for this purpose should be disclosed and should be appropriate to the size and complexity of the assessment task. Uncertainty should be indicated.

1.5.2 Existing data sources should have been searched and, where relevant, utilised. These should include ***government*** records and studies carried out by, or on behalf of, conservation agencies and/or special interest groups. ***Factors relating to other use of the sea area in question (e.g. for defence purposes, telecommunications infrastructure, fishing etc.) should, in particular, be described.***

1.5.3 ***Appropriate governmenta***l plans and policies, should be consulted and other data collected as necessary to assist in the determination of the "baseline" conditions, i.e. the probable future state of the environment, in the absence of the project, taking into account natural fluctuations and human activities (often called the "do-nothing" scenario).

2. IDENTIFICATION AND EVALUATION OF KEY IMPACTS

2.1 Definition of impacts: Potential impacts of the development on the environment should be investigated and described. Impacts should be broadly defined to cover all potential effects on the environment and should be determined as the predicted deviation from the baseline state.

2.1.1 A description should be given of the direct effects and any indirect, secondary, short, medium and long-term, permanent and temporary, positive and negative effects of the project.

Consideration should be given to the potential cumulative effects of the development with other activity, whether existing or potential, and to the possibility of transboundary impacts.

2.1.2 The above types of effect should be investigated and described with particular regard to identifying effects on or affecting; human beings, flora and fauna, ***seabed, geology,*** water, air, climate, material assets, cultural heritage (including ***wrecks***) and the interactions between these.

2.1.3 Consideration should not be limited to events which will occur under design operating conditions. Where appropriate, impacts which might arise from non-standard operating conditions, due to accidents, should also be described, ***with reference to a proper assessment of risk***. This risk assessment should related to Major Accident Hazards (MAHs) and Major Environmental Incidences (MEIs)

2.1.4 The impacts should be determined as the deviation from baseline conditions, i.e. the difference between the conditions which would obtain if the development were not to proceed and those predicted to prevail as a consequence of it.

2.2 Identification of impacts: Methods should be used which are capable of identifying all significant impacts.

2.2.1 Impacts should be identified using a systematic methodology such as project specific checklists, matrices, panels of experts, consultations, etc. Supplementary methods (e.g. cause-effect or network analyses) may be needed to identify secondary impacts.

2.2.2 A brief description of the impact identification methods should be given as should the rationale for using them.

2.3 Scoping: Not all impacts should be studied in equal depth. Key impacts should be identified, taking into account the views of interested parties, and the main investigation centred on these.

2.3.1 Arrangements should be made to ***inform and to*** collect the opinions and concerns of relevant public agencies, special interest groups, and the general public. ***The results of such consultation should be described and details given of how the opinions expressed have been taken into account.***

2.3.2 Key impacts should be identified and selected for more intense investigation. Impact areas not selected for thorough study should nevertheless be identified and the reasons they require less detailed investigation should be given.

2.4 Prediction of impact magnitude: The likely impacts of the development on the environment should be described in exact terms wherever possible.

2.4.1 The data used to estimate the magnitude of the main impacts should be sufficient for the task and should be clearly described or their sources be clearly identified. Any gaps in the required data should be indicated and the means used to deal with them in the assessment should be explained.

2.4.2 The methods used to predict impact magnitude should be described and be appropriate to the size and importance of the projected impact.

2.4.3 Where possible, predictions of impacts should be expressed in measurable quantities with ranges and/or confidence limits as appropriate. Qualitative descriptions, where these are used, should be as fully defined as possible (e.g. „insignificant means not perceptible from more than 100m distance").

2.5 Assessment of impact significance: The expected significance that the projected impacts will have for society should be estimated. The sources of quality standards, together with the rationale, assumptions and value judgements used in assessing significance, should be fully described.

2.5.1 The significance to ***the affected environment*** and to society in general should be described and clearly distinguished from impact magnitude. Where mitigating measures are proposed, the significance of any impact remaining after mitigation, should also be described.

2.5.2 The significance of an impact should be assessed, taking into account appropriate national and international quality standards where available. Account should also be taken of the magnitude, location and duration of the impact in conjunction with societal values.

2.5.3 The choice of standards, assumptions and value systems used to assess significance should be justified and any contrary opinions should be summarised.

3. ALTERNATIVES AND MITIGATION

3.1 Alternatives: Feasible alternatives to the proposed project should have been considered. These should be outlined in the Statement, the environmental implications of each presented, and the reasons for their rejection briefly discussed, particularly where the preferred project is likely to have significant, adverse environmental impacts.

3.1.1 Alternative sites should have been considered where these are practicable and available to the developer. The main environmental advantages and disadvantages of these should be discussed and the reasons for the final choice given.

3.1.2 Where available, alternative processes, designs and operating conditions should have been considered at an early stage of project planning and the environmental implications of these investigated and reported where the proposed project is likely to have significantly adverse environmental impacts.

3.1.3 If unexpectedly severe adverse impacts are identified during the course of the investigation, which are difficult to mitigate, alternatives rejected in the earlier planning phases should be re-appraised.

3.2 Scope and effectiveness of mitigation measures: All significant adverse impacts should be considered for mitigation. Evidence should be presented to show that proposed mitigation measures will be effective when implemented.

3.2.1 The mitigation of all significant adverse impacts should be considered and, where practicable, specific mitigation measures should be put forward. Any residual or unmitigated impacts should be indicated and justification offered as to why these impacts should not be mitigated.

3.2.2 Mitigation methods considered should include modification of the project, compensation and the provision of alternative facilities as well as pollution control.

3.2.3 It should be clear to what extent the mitigation methods will be effective when implemented. Where the effectiveness is uncertain or depends on assumptions about operating procedures, climatic conditions, etc., data should be introduced to justify the acceptance of these assumptions.

3.2.4 *The adverse environmental effects of proposed mitigation measures should be investigated and described.*

3.3 Commitment to mitigation: Developers should be committed to, and capable of, carrying out the mitigation measures and should present plans of how they propose to do so.

3.3.1 There should be a clear record of the commitment of the developer to the mitigation measures presented in the Statement. Details of how the mitigation measures will be implemented and function over the time span for which they are necessary should also be given.

3.3.2 Monitoring arrangements should be proposed to check the environmental impacts resulting from the implementation of the project and their conformity with the predictions within the Statement. Provision should be made to adjust mitigating measures where unexpected adverse impacts occur. The scale of these monitoring arrangements should correspond to the likely scale and significance of deviations from expected impacts.

3.3.3 *Where mitigation and monitoring proposals are to be implemented through integration into management plans or an Environmental Management System, these should be fully described and adequate for the purpose. The corporate health, safety and environment policy should be reproduced.*

4. COMMUNICATION OF RESULTS

4.1 Layout: The layout of the Statement should enable the reader to find and assimilate data easily and quickly. External data sources should be acknowledged.

4.1.1 There should be an introduction briefly describing the project, the aims of the environmental assessment and how those aims are to be achieved.

4.1.2 Information should be logically arranged in sections or chapters and the whereabouts of important data should be signalled in a table of contents or index. *The authorship of the ES should also be made clear including the competency of experts (Section A4 cover sheet).*

4.1.3 Unless the chapters themselves are very short, there should be chapter summaries outlining the main findings of each phase of the investigation.

4.1.4 When data, conclusions or quality standards from external sources are introduced, the original source should be acknowledged at that point in the text. A full reference should also be included either with the acknowledgement, at the bottom of the page, or in a list of references.

4.2 Presentation: Care should be taken in the presentation of information to make sure that it is accessible to the non-specialist.

4.2.1 Information should be presented so as to be comprehensible to the non-specialist. Tables, graphs and other devices should be used as appropriate. Unnecessarily technical, obscure *or ambiguous* language should be avoided.

4.2.2 Technical terms, acronyms and initials should be defined, either when first introduced into the text or in a glossary. Important data should be presented and discussed in the main text.

4.2.3 The Statement should be presented as an integrated whole. Summaries of data presented in separately bound appendices should be introduced in the main body of the text.

4.3 Emphasis: Information should be presented without bias and receive the emphasis appropriate to its importance in the context of the ES.

4.3.1 Prominence and emphasis should be given to potentially severe adverse impacts as well as to potentially substantial favourable environmental impacts. The Statement should avoid according space disproportionately to impacts which have been well investigated or are beneficial.

4.3.2 The Statement should be unbiased; it should not lobby for any particular point of view. Adverse impacts should not be disguised by euphemisms or platitudes.

4.4 Non-technical summary: There should be a clearly written non-technical summary of the main findings of the study and how they were reached.

4.4.1 There should be a non-technical summary of the main findings and conclusions of the study. Technical terms, lists of data and detailed explanations of scientific reasoning should be avoided.

4.4.2 The summary should cover all main issues discussed in the Statement and contain at least a brief description of the project and the environment, an account of the main mitigation measures to be undertaken by the developer, and a description of any significant residual impacts. A brief explanation of the methods by which these data were obtained, and an indication of the confidence which can be placed in them, should also be included."

Appendix 2

EIA Regulations Schedule 2 changes:

Comparison between Schedule 2 (information to be included in an environmental statement) of The Offshore Petroleum Production and Pipe-lines (Assessment of Environmental Effects) Regulations 1999 and Schedule 2 of The Offshore Petroleum Production and Pipe-lines (Environmental Impact Assessment and other Miscellaneous Provisions) (Amendment) Regulations 2017

SI 1999/360	SI 2017/582
(a) description of the project (i) land and seabed use requirements (ii) characteristics prod. processes (iii) estimated residues & emissions	1. description of the relevant project (a) location (b) physical characteristics (c) main characteristics operational phase (d) estimated residues & emissions
(d) reasonable alternatives	2. reasonable alternatives
	3. environmental baseline
(c) data required to identify and assess the main effects (i) human population, fauna, flora, soil including seabed and subsoil, water including the sea and any aquifers under the seabed, air, climatic factors, landscape or seascape, tangible property, architectural and archaeological heritage and the interaction between any of the foregoing	4. factors likely to be significantly affected: population, human health, biodiversity (e.g. fauna and flora), land (e.g. land take), soil (e.g. organic matter, erosion, compaction, sealing), water (e.g. hydromorphological changes, quantity and quality), air, climate (e.g. greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape
(c) (ii) description of the likely significant effects on the environment arising from the existence of the project, the use of natural resources, the emission of pollutants, the creation of nuisances and the elimination of waste *"effect" includes, except where the context otherwise requires, any direct, indirect, secondary, cumulative, short, medium or long-term, permanent or temporary, or positive or negative effect	5. likely significant effects of the project (a) construction and existence of the project (b) use of natural resources (sustainability) (c) emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste (d) risks to human health, cultural heritage or the environment (e.g. due to accidents or disasters) (e) cumulation of effects with other existing or approved projects

(f) an indication of any difficulties (technical difficulties or lack of know-how) encountered in compiling the required information	(f) impact of the project on climate and vulnerability to climate change (g) technologies and the substances used must cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project and should take into account environmental protection objectives established at EU or at national level relevant to the project
(c) (ii) details of forecasting methods used to assess the effects on the environment	6. description of forecasting methods or evidence, used to identify and assess significant effects on the environment, including details of difficulties (e.g. technical deficiencies or lack of knowledge) encountered compiling required information and main uncertainties involved
(f) an indication of any difficulties (technical difficulties or lack of know-how) encountered in compiling the required information	
(b) avoid, reduce and, if possible remedy	7. avoid, prevent, reduce or, if possible, offset and where appropriate, proposed monitoring arrangements
	8. paragraph 7 should explain the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases
	9. description of the expected significant adverse effects of the relevant project on the environment deriving from the vulnerability of the project to risks of major accidents or disasters
	10. Relevant information available and obtained through risk assessments pursuant to EU legislation (i.e. major accident hazards, nuclear safety)
	11. Re: paragraph 9, include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.
(e) A non-technical summary	12. A non-technical summary
	13. reference list detailing sources used for descriptions and assessments included in the environmental statement

Acronyms

BEIS	UK Department for Business, Energy and Industrial Strategy
CA	Competent Authority
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CIEEM	Chartered Institute of Ecology and Environmental Management
DMR	Department of Mineral Resources
EC	European Commission
EIS/ES	Environmental Impact Statement (also known as the environmental impact report)
EIA	Environmental Impact Assessment
EM	Environmental Manager (at OPRED)
EMP	Environmental Monitoring/Management Plan
EMS	Environmental Management System
EMT	Environmental Management Team (at OPRED)
FI	Falkland Islands
FIG	Falkland Islands Government
HSE	Health and Safety Executive
IEMA	Institute of Environmental Management and Accreditation
MAH	Major Accident Hazard
MEI	Major Environmental Incident
MMM	Making the Most of Masters programme
MoU	Memorandum of Understanding
NGO	Non-governmental organisation
PETS	Portal Environmental Tracking System (OPRED)
PMO	Premier Oil
OEI	Offshore Environmental Inspectorate
OMO	Offshore Minerals Ordinance
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
RA	Risk Assessment
SAMS	Scottish Association of Marine Science
SEPA	Scottish Environmental Protection Agency
SoS	Secretary of State

SRSL SAMS Research Services Ltd.

UKCS United Kingdom Continental Shelf

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