


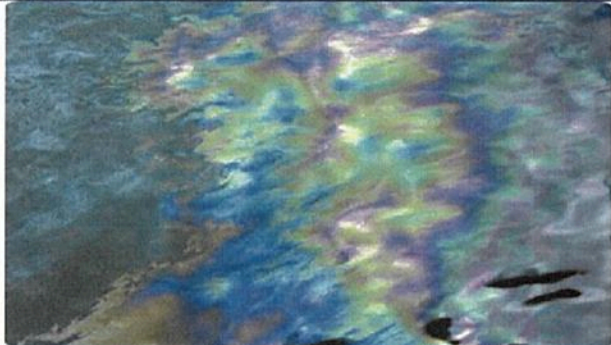


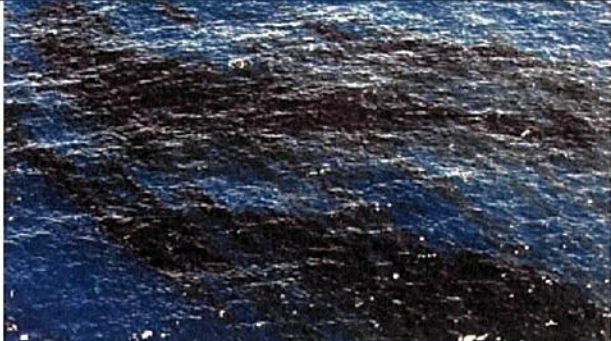


Intentionally Left Blank

Uncontrolled when Printed

Appendix A - BAOAC Quick Guide

Uncontrolled when Printed

BAOAC Quick Guide	
	<p>Code 1 Oil Sheen Silvery</p> <p>% Of Area Affected _____%</p>
	<p>Code 2 Oil Sheen Rainbow</p> <p>% Of Area Affected _____%</p>
	<p>Code 3 Oil Sheen Metallic</p> <p>% Of Area Affected _____%</p>
	<p>Code 4 Discontinuous True Colours</p> <p>% Of Area Affected _____%</p>
	<p>Code 5 True Colours</p> <p>% Of Area Affected _____%</p>



Appendix A - BAOAC Quick Guide

BAOAC Quick Guide	
Code	Description
<p>Code 1 Oil Sheen Silvery ($< 0.3 \mu\text{m}$)</p>	<p>The very thin films of oil reflect the incoming light better than the surrounding water and can be seen as a silvery or grey sheen. Above a certain height or angle of view the observed film may disappear.</p>
<p>Code 2 Oil sheen Rainbow ($0.3 \mu\text{m} - 5.0 \mu\text{m}$)</p>	<p>Rainbow oil appearance is caused by an optical effect and independent of oil type. Depending on angle of view and layer thickness, the distinctive colours will be diffuse or very bright. Bad light conditions may cause the colours to appear duller. A level layer of oil in the rainbow region will show different colours through the slick because of the change in angle of view. Therefore if rainbow is present, a range of colours will be visible.</p>
<p>Code 3 Oil sheen Metallic ($5.0 \mu\text{m} - 50 \mu\text{m}$)</p>	<p>Although a range of colours can be observed (e.g. blue, purple, red and greenish) the colours will not be similar to 'rainbow'. Metallic will appear as a quite homogeneous colour that can be blue, brown, purple or another colour. The 'metallic' appearance is the common factor and has been identified as a mirror effect, dependent on light and sky conditions. For example blue can be observed in blue-sky conditions.</p>
<p>Code 4 Discontinuous True Colours ($50 \mu\text{m} - 200 \mu\text{m}$)</p>	<p>For oil slicks thicker than $50 \mu\text{m}$ the true colour will gradually dominate the colour that is observed. Brown oils will appear brown, black oils will appear black. The broken nature of the colour, due to thinner areas within the slick, is described as discontinuous. Discontinuous should not be mistaken for 'coverage'. Discontinuous implies true colour variations and not non-polluted areas.</p>
<p>Code 5 True Colours ($>200 \mu\text{m}$)</p>	<p>The true colour of the specific oil is the dominant effect in this category. A more homogenous colour can be observed with no discontinuity as described in Code 4. This category is strongly oil type dependent and colours may be more diffuse in overcast conditions.</p>

Uncontrolled when Printed



Preface

OPEP Operational Index

ROff 1. Offshore Response Action Plan	1-1
ROff 1.1. Initial Spill Report Form	1-5
ROff 1.2. Platform Data	1-6
ROff 1.3. Schiehallion Infrastructure	1-7
ROff 1.4. Topside Hydrocarbon Storage Inventories	1-8
ROff 1.5. Production Flowlines & Riser Hydrocarbon Storage Inventories	1-10
ROff 1.6. Pipeline Hydrocarbon Storage Inventories	1-11
ROff 1.7. Spill Size Estimation Matrix	1-12
ROff 1.8. Spill Size Estimation - Example	1-13
ROff 1.9. Bonn Agreement Oil Appearance Code	1-13
ROff 1.10. Conversion Table	1-14
ROff 1.11. Offshore Notification Matrix	1-14
ROff 1.12. ePON 1 – Offshore Reporting	1-15
ROff 1.13. Manual Spill Tracking	1-16
ROff 1.14. Spill Sampling Checklist	1-17
ROff 1.15. Tiered Assessment Checklist	1-18
ROff 1.16. Response Strategy Options	1-19
ROff 1.17. Response Strategy Guidance	1-20
ROff 1.18. Tiered Response Resources	1-21
ROff 1.19. Testing Dispersant Efficiency Procedure	1-22
ROff 1.20. Jigsaw Coverage of BP Assets	1-23
Preface	iii
Document Management	iii
Document Control Procedure	iii
Department of Energy & Climate Change (DECC) Letter of Approval	iv
Document Control and Distribution	v
Version Control	v
List of Copy Holders	v
Oil Spill Response Terminology	vii
Annex 1. Introduction	9
A1.1. Plan Design	9
A1.2. OPEP Structure	9
A1.3. Scope of Plan	10
A1.4. Roles and Responsibilities for BP Oil Spill Response	10
A1.4.1 Spills within the 500m Safety Zone of a BP Installation	11
A1.4.2 Spills out with the 500m Safety Zone of a BP Installation – BP source	11
A1.4.3 Spill from Shuttle Tanker within the 500m Safety Zone of Schiehallion	11
A1.4.4 Spill from a Vessel Outside of 500m Zone with BP Interest	11
A1.4.5 Out with the 500m Safety Zone of a BP Installation	11
A1.4.6 Out with the 500m Safety Zone, Unknown Source	11
A1.4.7 Oil Spill with Potential or Actual Shoreline Impact	11
A1.4.8 Oil Spill Approaching Shetland Waters from the WoS fields	12
A1.4.9 Oil Spill Approaching Norwegian Waters	12
A1.4.10 Oil Spill Approaching Faroese Waters	13
A1.4.11 Oil Spill from Pipeline Incidents	13

Offshore Oil Pollution Emergency Plan - Schiehallion

A1.5.	Field Vessels and Rigs in Transit	13
Annex 2. Drilling Rig Information and Response Interfaces		14
A2.1.	Platform Drilling	14
A2.2.	MODU Drilling within the Schiehallion Field	14
Annex 3. Field Information		15
A3.1.	Platform Data	15
A3.2.	Schiehallion Area Infrastructure	15
A3.3.	Subsea Tie-ins & Pipelines	15
A3.4.	Hydrocarbon Storage Inventories.....	15
A3.4.1	Initiating Events.....	16
A3.5.	Schiehallion Field Oil Properties	17
A3.6.	Oil Characteristics and Fate of Oil.....	17
A3.6.1	Schiehallion Crude.....	18
A3.6.2	Diesel Oil.....	18
Annex 4. Receiving Environment		19
A4.1.	Environmental & Commercial Sensitivities.....	19
A4.2.	Metocean Data	20
Annex 5. Modelling Outputs.....		21
A5.1.1	Stochastic Modelling	21
A5.2.	Scenarios	22
A5.2.1	Schiehallion Well Blowout Scenario – OSCAR model	22
A5.2.2	Schiehallion Well Blowout Scenario – OSIS model	23
A5.2.3	Schiehallion Cargo Tank Rupture	24
Annex 6. Response Procedures and Guidance.....		25
A6.1.	Reporting of an Oil (Hydrocarbon) Spill.....	25
A6.1.1	Initial Offshore Notification Requirements.....	25
A6.1.2	Estimating Spill Size	25
A6.1.3	Estimating Spill Movement.....	25
A6.2.	Computer Prediction of Slick Movement	25
A6.3.	Tier Size Identification	25
A6.4.	Response Strategy Operational Guidelines	25
A6.4.1	Selecting an Initial Offshore Response Strategy.....	25
A6.5.	Available Response Strategies.....	26
A6.6.	Tiered Response Resources	26
Annex 7. Additional Information.....		27
A7.1.	Resource Maintenance, Training and Testing.....	27
A7.1.1	Training & Exercise Program	27



Preface

Preface

Document Management

Document Control Procedure

BP produced Oil Pollution Emergency Plans (OPEP's) are controlled documents. All document holders, detailed within the distribution list, are assigned a specific copy number.

This document will be subject to review on an annual basis and updated as necessary by BP or its contractor to:

- Ensure compliance with current and best industry practice;
- Reflect exercise / audit recommendations;
- Include changes to operational activity and procedures;
- Remove any activities which are, or have, become obsolete;
- Incorporate current contact details.

This document has an approved lifespan of five years from the date of approval by DECC and it must be submitted in its entirety for re-approval 2 months before that time. It is the responsibility of the registered copy holder to maintain the accuracy of this document. All updates must be promptly inserted and acknowledged by signing the document transmittal page and returning a copy to the document management service provider upon receipt.

Uncontrolled when Printed



Offshore Oil Pollution Emergency Plan - Schiehallion

Department of Energy & Climate Change (DECC) Letter of Approval

As approved under the Merchant Shipping (Oil Pollution Preparedness, Response and Co-Operation Convention) Regulations 1998 & the Offshore Installations (Emergency Pollution Control) Regulations 2002.

**THE MERCHANT SHIPPING (OIL POLLUTION PREPAREDNESS, RESPONSE
AND CO-OPERATION CONVENTION) REGULATIONS 1998**

**THE OFFSHORE INSTALLATIONS (EMERGENCY POLLUTION CONTROL)
REGULATIONS 2002**

APPROVAL OF OIL POLLUTION EMERGENCY PLAN

Pursuant to the above-mentioned Regulations, the Secretary of State hereby approves the **BP, Schiehallion** oil pollution emergency plan, which was received by the Department on **January 19, 2011**.

For and on behalf of the Secretary of State

Authorised to act in that behalf

17 March 2011

Uncontrolled when Printed



Preface

Document Control and Distribution

Version Control

BP Doc Ref No: SCH-EM-002

Date	Issue No	Version	Notes	Author	QA Assessor	QA Date
11/03/11	1.0	1.0	Draft 1	Kat Douglas	Layla Gill	11/03/11

List of Copy Holders

Copy Holder Name	Location	Copy Type	Copy No
OIM, Schiehallion FPSO	OIM, Schiehallion FPSO	Paper & Electronic	1
Data Control Centre (DCC)	c/o ODL, Aberdeen	Paper	2
Dyce Control Room, Aberdeen	Dyce Control Room, Aberdeen, BP E&P UK, Aberdeen	Paper & Electronic	3
Sullom Voe Terminal	Sullom Voe Terminal, Mossbank, Shetland	Paper & Electronic	4
Master ERRV - Grampian Frontier	Master Grampian Frontier, C/O Vessel Owners (North Star Shipping)	Paper	5
Master Relief ERRV - Grampian Conquest	Master Grampian Conquest, C/O Vessel Owners (North Star Shipping)	Paper	6
Dept of Energy & Climate Change	Offshore Inspectorate (offshore.inspectorate@decc.gsi.gov.uk)	Paper and Electronic	7
Maritime & Coastguard Agency, Duty Officer	MRCC Shetland, The Knab, Knab Road, Lerwick, ZE1 0AX	Paper	8
JNCC, Aberdeen	Joint Nature Conservation Committee, Inverdee House, Aberdeen	Electronic	9
Marine Scotland, Aberdeen	Marine Scotland, Aberdeen	Electronic	10
Document Control Dept, OSR, Southampton	Document Control Dept, OSR, Southampton	Electronic	11
Technical Authority, BP	BP E&P UK, Dyce, Aberdeen	Paper & Electronic	12
Schiehallion Environmental Advisor	BP E&P UK, Dyce, Aberdeen	Electronic	13
RSV – Caledonian Vanguard	Atmosphere 1, Bibby Ship Management Ltd, Prospect Road, Westhill	Monthly CD	14
RSV – Caledonian Victory	Atmosphere 1, Bibby Ship Management Ltd, Prospect Road, Westhill	Monthly CD	15
RSV – Caledonian Vigilance	Atmosphere 1, Bibby Ship Management Ltd, Prospect Road, Westhill	Monthly CD	16
RSV – Caledonian Vision	Atmosphere 1, Bibby Ship Management Ltd, Prospect Road, Westhill	Monthly CD	17
RSPB, East Scotland Regional Office	RSPB, Albyn Terrace, Aberdeen	Electronic	18
Scottish Natural Heritage, Aberdeen	SNH, Inverdee House, Aberdeen	Electronic	19



Offshore Oil Pollution Emergency Plan - Schiehallion

Copy Holder Name	Location	Copy Type	Copy No
SEPA, North Region	Graesser House, Fodderty Way, Dingwall	Electronic	20
Orkney Harbour Authority	Harbour Authority Building, Scapa, Orkney	Electronic	21
Sullom Voe Harbour Authority	Port Administration Building, Sella Ness, Sullom Voe, Shetland	Electronic	22
Withdrawn	Withdrawn	Withdrawn	23
Withdrawn	Withdrawn	Withdrawn	24
Withdrawn	Withdrawn	Withdrawn	25
Withdrawn	Withdrawn	Withdrawn	26
OIM, Island Constructor	OIM, Island Constructor	Paper & Electronic	27
Island Offshore ERT	c/o Island Offshore, Bucksburn, Aberdeen	Paper	28
BP Well Site Leader	c/o BP E&P UK, Dyce, Aberdeen	Paper	29
Withdrawn	Withdrawn	Withdrawn	30
Withdrawn	Withdrawn	Withdrawn	31

Uncontrolled when Printed



Preface

Oil Spill Response Terminology

Name	Description
ARRC	Autonomous Rescue & Recovery Craft (carried on board RSVs)
BAOAC	Bonn Agreement Oil Appearance Code
BOPD	Barrels of Oil per Day
BST	Business Support Team
CNS	Central North Sea
CPR	Counter Pollution & Response Branch (MCA)
CPSO	Counter Pollution & Salvage Officer
CRO	Control Room Operator
DCR	Dyce Control Room
DEFRA	Department for Environment, Fisheries and Rural Affairs
DECC	Department of Energy and Climate Change
DfT	Department for Transport
DPO	Duty Pollution Officer
EA	Environment Agency
ECP	Environmental Control Procedure
EOM	Emergency Operations Manager
EPC	Offshore Installations (Emergency Pollution Control) Regulations 2002
ERC	Emergency Response Centre
ERP	Emergency Response Plan
ERT	Emergency Response Team
ERRV	Emergency Response & Rescue Vessel
EST	Executive Support Team
ETA / D	Estimated Time of Arrival / Departure
Flt	Flight
HMCG	HM Coastguard
HRC	Highland Regional Council
HSE	Health and Safety Executive
IMT	Incident Management Team
ITOPF	International Tanker Owners Pollution Federation
JNCC	Joint Nature Conservation Committee
LA	Local Authority
MCA	Maritime and Coastguard Agency
MMO	Marine Management Organisation (formerly Marine Fisheries Agency)
MMSCFD	Million standard cubic feet per day
MODU	Mobile Offshore Drilling Unit
MS	Marine Scotland
MSDS	Material Safety Data Sheets
NCP	National Contingency Plan
NE	Natural England
NEBA	Net Environmental Benefit Approach
NNS	Northern North Sea
OBM	Oil Based Mud

Uncontrolled when Printed



Offshore Oil Pollution Emergency Plan - Schiehallion

Name	Description
OH	Office Hours
OOH	Out of Office Hours
OIC	Orkney Islands Council
OIM	Offshore Installation Manager (includes Platform Manager)
OPEP	Oil Pollution Emergency Plan
OPOL	The Offshore Pollution Liability Association
OPPC	Offshore Petroleum Activities (Oil Pollution Prevention & Control) Regulations 2005
OPRC	The Merchant Shipping (Oil Pollution Preparedness & Response Co-operation Convention) Regulations 1998
OSC	On-scene Co-ordinator
OSR	Oil Spill Response
OCU	Operations Control Unit
PON	Petroleum Operations Notice
RSPB	Royal Society for the Protection of Birds
RSV	Regional Support Vessel
SEPA	Scottish Environment Protection Agency
SG	Specific Gravity
SGA	Southern Gas Assets
SIC	Shetland Islands Council
SMPEP	Shipboard Marine Pollution Emergency Plan (applies to all vessels >150 GRT carrying noxious liquid substances)
SNH	Scottish Natural Heritage
SNS	Southern North Sea
SOPEP	Shipboard Oil Pollution Emergency Plan (all oil tankers >150 GRT and vessels >400 GRT must carry a SOPEP onboard)
SOSREP	Secretary of States Representative
SVHA	Sullom Voe Harbour Authority
SRC	Shoreline Response Centre
SVT	Sullom Voe Terminal
TCC	Terminal Control Centre
VTs	Vessel Traffic Service
WoS	West of Shetland
WOSPS	West of Shetland Pipeline System

Uncontrolled when Printed



Introduction

Annex 1. Introduction

A1.1. Plan Design

This Oil Pollution Emergency Plan (OPEP) has been designed to provide BP E&P UK offshore response personnel with the information and processes necessary to implement an effective and proportionate response to an oil spill incident originating from the Schiehallion FPSO & associated subsea infrastructure.

In accordance and alignment with UK Legislative requirements¹, this plan details a three tiered response capability based on the following key factors: oil types; oil properties; potential quantities; metocean data (metrological & oceanographic); environmental and economic sensitivities and the response capabilities of both BP and their response contractor's resources.

A1.2. OPEP Structure

Based on BP's operational assets and for ease of use by BP response personnel, the oil spill response arrangements covering Schiehallion are detailed in two separate plans:

1. Offshore OPEP (BP Doc Ref No: SCH-EM-002)

Designed specifically for use by the offshore response personnel, this plan has been sub divided into two distinctive sections to fulfil its operational as well as mandatory requirements:

i) Operational Section

This section details all the necessary operational information and guidance that may be required by the OIM to determine and enact an appropriate response. The information is presented in a sequence expected to be followed in the event of a spill and is concise in content to facilitate clear focus on the required actions to be undertaken offshore.

ii) Non-operational Section

This section details the supporting Schiehallion information necessary to align the document with the planning requirements. In order to streamline the document non operational sections are supported by information detailed within the operational section and will require an element of cross referencing by the reader.

2. Onshore OPEP (BP Doc Ref No: UKCS-EM-002)

This plan is designed to be used by the BP onshore support team and cross references / interfaces with the Schiehallion OPEP where necessary. Please refer to the Onshore OPEP in conjunction with this document.

All personnel expected to access this plan will have received formal training in its use and application, in addition to attending the mandatory Oil Spill Response courses stipulated by DECC.

¹ Merchant Shipping (Oil Pollution Preparedness & Response Cooperation Convention) Regulations 1998, Offshore (Emergency Pollution Control) Regulations 2002 & Guidance to Operators of Offshore Installations (including pipelines) Version 3 2009. See onshore OPEP for detailed description.

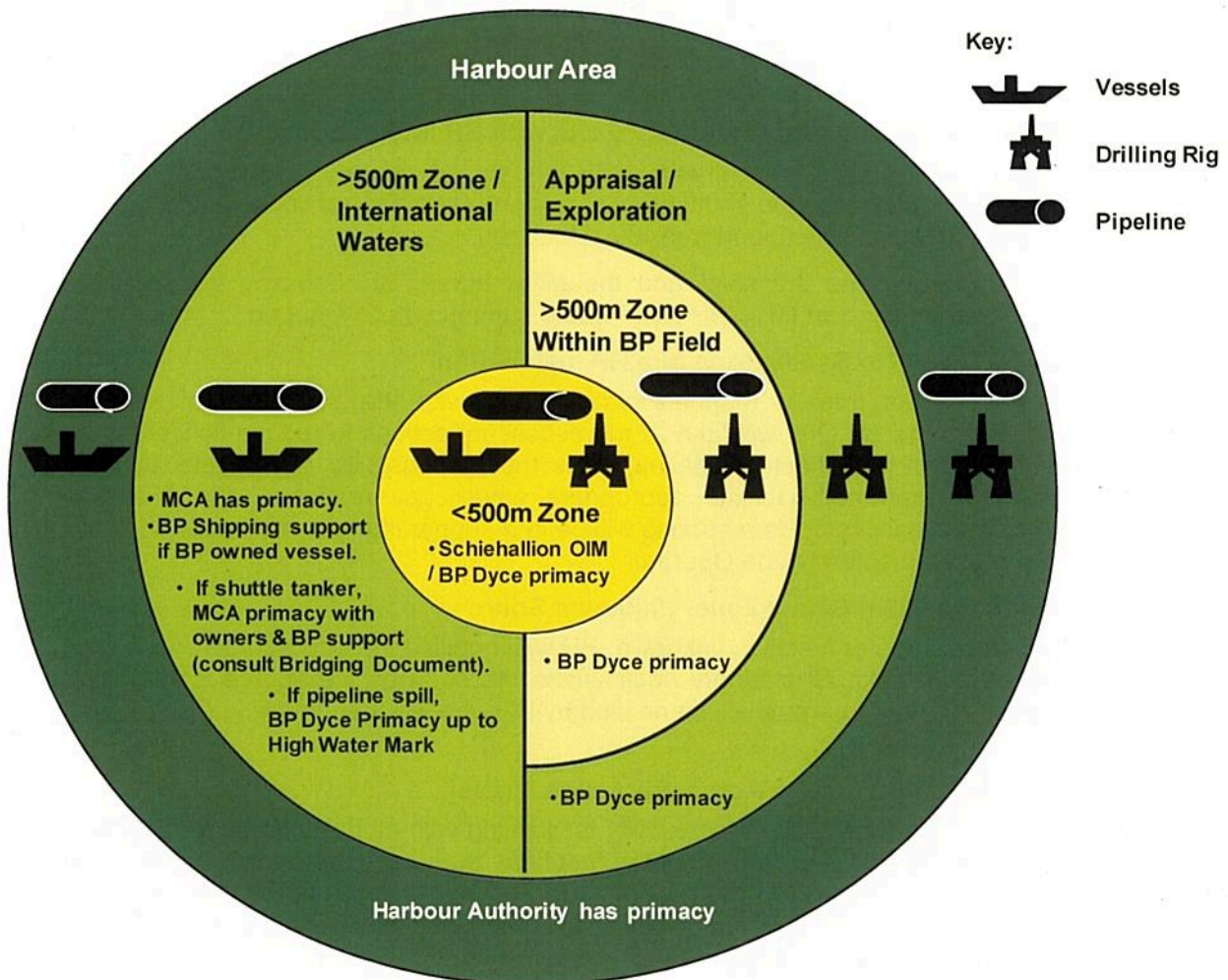
Offshore Oil Pollution Emergency Plan - Schiehallion

A1.3. Scope of Plan

This OPEP has been prepared to cover the offshore response to oil/hydrocarbon spillages from the:

- Schiehallion FPSO;
- Production well risers from Schiehallion and Loyal reservoirs;
- Platform Drilling;
- Foinaven Manifold M3 to Schiehallion Manifold M1C gas pipeline (please note this pipeline is covered under the *Foinaven OPEP FOIN-EM-002*);
- Schiehallion Manifold M1C to Sullom Voe Terminal gas pipeline (please note this pipeline is covered under the BP NSI WOS and Clair Gas Pipelines Emergency Procedures Manual WOSPS-EM-001);
- Drilling rigs performing appraisal / workover / development wells on the above locations;
- Construction, supply and survey traffic when working in the 500m zone of the Schiehallion FPSO.

A1.4. Roles and Responsibilities for BP Oil Spill Response



Uncontrolled when Printed



Roles and Responsibilities

A1.4.1 Spills within the 500m Safety Zone of a BP Installation

The BP OIM of the Schiehallion FPSO is legally responsible for all activities within the 500 metre exclusion zone. The OIM will initially assume the role of On-Scene Co-ordinator and is responsible for undertaking all possible measures to control the release, notifying all relevant statutory and corporate entities and mobilising Tier 1 response assets as deemed necessary. Further assistance will be provided through the BP onshore emergency response organisation.

A1.4.2 Spills out with the 500m Safety Zone of a BP Installation – BP source

If a spill occurs out with the 500m safety zone, BP will co-ordinate the response utilising both onshore and offshore response teams. Offshore will take all the necessary actions to reduce flow/pressure and shut down the affected pipeline. The onshore IMT will then take the lead in co-ordinating and mobilising a response thereafter.

A1.4.3 Spill from Shuttle Tanker within the 500m Safety Zone of Schiehallion

If a hydrocarbon spill occurs from a shuttle tanker (Hanne Knutsen – Knutsen OAS Shipping AS or Loch Rannoch – BP Shipping) within the Schiehallion 500 metre exclusion zone, the BP OIM retains response primacy. The Master of the shuttle tanker is responsible for immediately informing the Schiehallion OIM of any hydrocarbon spill to sea originating from the vessel. In the event of a spill occurring from a shuttle tanker within the 500 metre exclusion zone, the Schiehallion Joint Operations Manual (SCH-MAL-004) should be referred to.

Within the Schiehallion 500m zone the Schiehallion OPEP will take precedence over the shuttle tanker SOPEP.

A1.4.4 Spill from a Vessel Outside of 500m Zone with BP Interest

If a spill occurs from a vessel with a BP interest e.g. shuttle tanker, out with the 500m zone, it will be for the shuttle tanker owner to lead the response using its own oil spill plan, albeit with support from BP if required.

If BP Shipping owns the ship, and the MCA agree, BP Shipping will lead the response with their own IMT. BP Dyce would support where required.

A1.4.5 Out with the 500m Safety Zone of a BP Installation

If a spill occurs from a manned platform out with the 500m safety zone of Schiehallion, the BP OIM will take all the necessary actions to reduce flow/pressure and shut down the affected pipeline. It is the responsibility of the relevant field operator to then mobilise the appropriate emergency response and make all statutory notifications. BP's response will be in a supporting role, and assistance will be given as requested by the Operator.

A1.4.6 Out with the 500m Safety Zone, Unknown Source

Where the source of a spill is unknown, BP will mobilise the appropriate emergency response and make all statutory notifications. As soon as the source is identified, the relevant asset Operator will be notified by BP who will then revert to a supporting role.

A1.4.7 Oil Spill with Potential or Actual Shoreline Impact

If the oil has beached, the responsibility for dealing with oil pollution of the coastline rests principally with the local/unitary authorities. In the event of a spill approaching the Shetland coastline, BP will be engaged and make available coastal response resources located in Shetland. A detailed description of Shetlands response co-ordination is detailed in section A1.4.8.

Offshore Oil Pollution Emergency Plan - Schiehallion

A1.4.8 Oil Spill Approaching Shetland Waters from the WoS fields

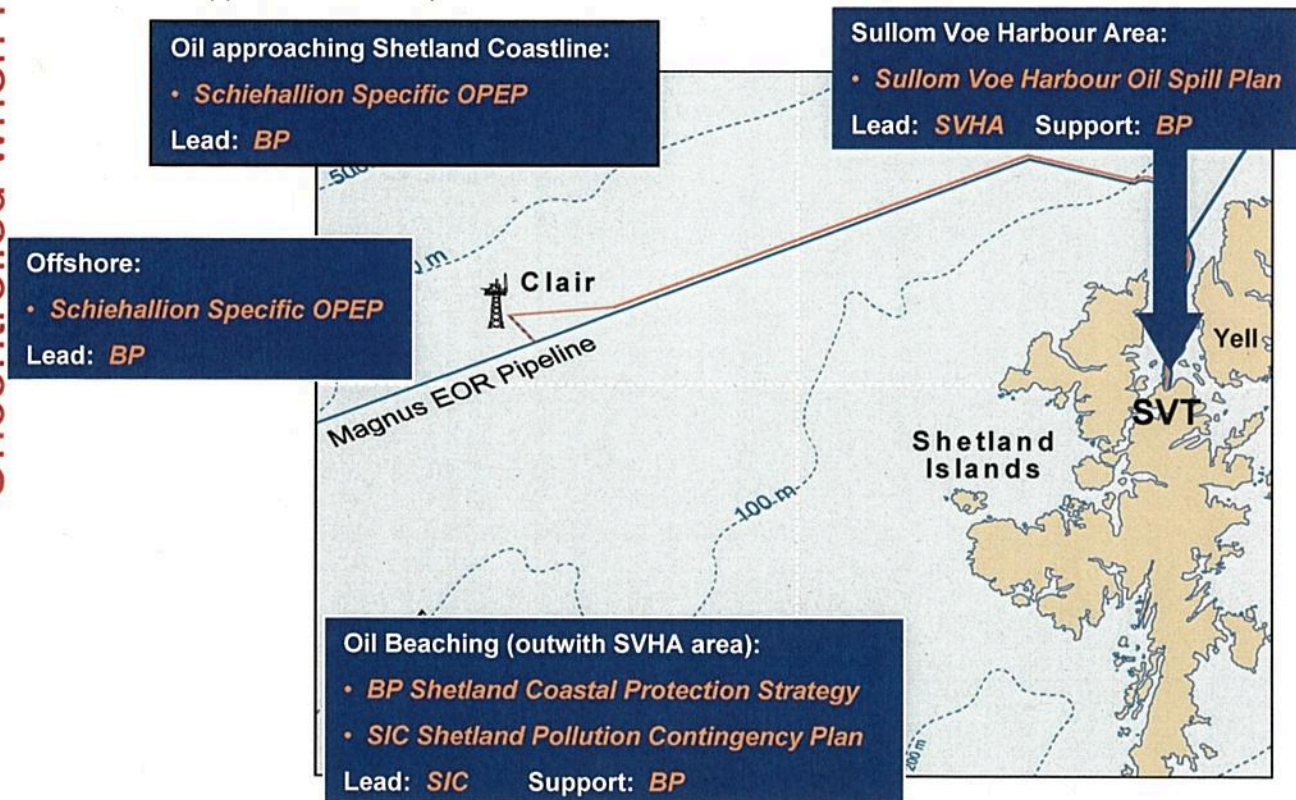
In the event of a major oil spill which approaches Shetland from the Schiehallion field, a number of oil spill emergency plans are in place that may be triggered. These are in addition to resources located in Shetland for coastal response. The main plans in place are:-

- Schiehallion offshore specific OPEP;
- BP Shetland Coastal Protection Strategy;
- BP Shetland Coastal Response Resource (with call-out procedure);
- SVHA Oil Spill Plan for spills occurring within SVHA harbour area (or entering the area);
- SIC Shetland Marine Pollution Contingency Plan.

For oil spills entering the Sullom Voe Harbour Area, the SVHA Oil Spill Plan will be enacted under the auspices of the SIC who will become the lead organisation. BP will provide support utilising extensive equipment and personnel resources based at SVT.

For oil spills outside SVHA the Shetland Marine Pollution Contingency plan will be enacted. BP's Shetland Response trailers and SVT equipment will be provided in support of SIC led operations.

Uncontrolled when Printed



A1.4.9 Oil Spill Approaching Norwegian Waters

In the event of a major spill which is predicted to cross over the median line into Norwegian waters, the NORBRIT plan will be activated. The DPO should advise the MCA that the spill is approaching Norwegian waters at which point the MCA will take the decision to activate the NORBRIT plan. Co-ordination of the response strategy with the Norwegian authorities will be facilitated through the MCA.



Roles and Responsibilities

A1.4.10 Oil Spill Approaching Faroese Waters

In the event of a major spill which is predicted to cross over the median line into Faroese waters, the DPO should advise the MCA. At this point the MCA will take the decision to liaise with the Faroese authorities. Co-ordination of the response strategy with the Faroese authorities will be facilitated through the MCA.

A1.4.11 Oil Spill from Pipeline Incidents

BP operate a number of offshore pipelines, which are either buried, trenched or lying proud on the seabed. Each pipeline is covered by an emergency plan which details actions to be taken should an incident be discovered or suspected. In the event of an incident concerning the Schiehallion gas pipeline, BP NSI WOS and Clair Gas Pipelines Emergency Procedures Manual (WOSPS-EM-001) should be referred to for specific technical support information.

A1.5. Field Vessels and Rigs in Transit

The vessel owners hold the statutory duty for reporting and dealing with pollution from any field support vessel or installation when en route to the location or, prior to establishing the 500m safety zone around the installation.

In the event of a spill during transit, reporting to Government Agencies and to BP rests with the vessel or rig owner who will implement the appropriate MARPOL approved Shipboard Oil Pollution Emergency Plan (SOPEP).² BP will support the response as necessary.

Vessels within the BP fleet operate to SOPEP or SMPEP as appropriate.

Uncontrolled when Printed

² This plan is approved by a classification society or Flag State and is required under Regulation 26, Annex 1 of MARPOL 73/78.



Offshore Oil Pollution Emergency Plan - Schiehallion

Annex 2. Drilling Rig Information and Response Interfaces

A2.1. Platform Drilling

Drilling from the Schiehallion FPSO is a likely probability within the lifespan of the field. Although the exact timings of such operations are not detailed within this document, the risks associated with an incident and the environmental consequences are. These have then been accounted for in the development of the response strategy.

A2.2. MODU Drilling within the Schiehallion Field

Drilling addendums will be produced by BP to cover future drilling operations within the Schiehallion Field undertaken from mobile offshore drilling units. These documents will be given their own OPEP number and are subjected to the two month consultation period by DECC. They will detail the roles and responsibilities of concerned contractors (i.e. drilling) in addition to those detailed in this plan and the communication pathways to be followed. In the event of oil spill resulting from MODU drilling operations, the relevant drilling addendum (document reference number will be detailed within this section) should be referred to in conjunction with this OPEP and are to be found at the end of the main plan.

Uncontrolled when Printed

Field Information

Annex 3. Field Information

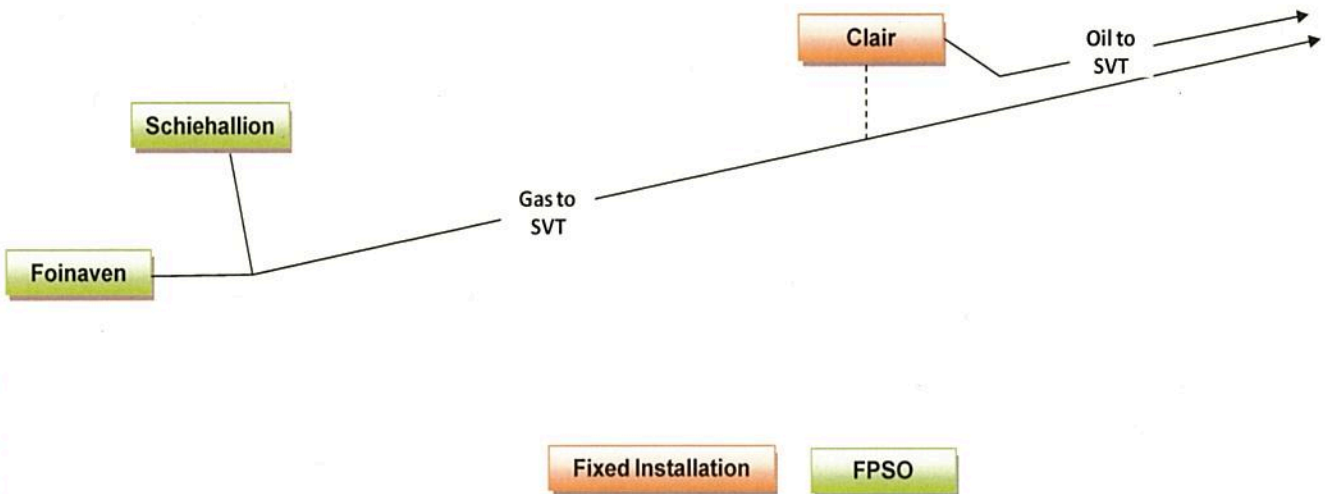
A3.1. Platform Data

This is detailed in the *Offshore Response Action Plan, ROFF 1.2.*

A3.2. Schiehallion Area Infrastructure

This is detailed in the *Offshore Response Action Plan, ROFF 1.3.*

A3.3. Subsea Tie-ins & Pipelines



A3.4. Hydrocarbon Storage Inventories

To assist in assessing the potential / actual spill volumes associated with the Schiehallion field, the topside and subsea hydrocarbon inventories have been identified and documented. These are detailed in the *Offshore Response Action Plan, Sections ROFF 1.4, ROFF 1.5 and ROFF 1.6.* These sections also detail locations, length, diameters, flow rates and shut down rates for subsea facilities and pipelines.

Uncontrolled when Printed

Offshore Oil Pollution Emergency Plan - Schiehallion

A3.4.1 Initiating Events

Initiating events have a major influence on the volume of oil that can be released. Being able to identify these events and the potential containing systems that are at risk provide an indication as to worst case scenarios. The table below identifies such events in relation to containing systems at risk within the Schiehallion field.

Initiating Events	Containing Systems at Risk
External Corrosion (weathering)	Subsea pipelines, risers.
Internal Corrosion	Subsea & topside pipelines & topside vessels
Erosion	Pipework
Impact damage (from vessel)	Pipelines, subsea infrastructure, risers
Over Pressurisation	Topside vessels
Fire and Explosion	Topside vessels and pipework
Vibration	Topside vessels and pipework
Structural Failure	Subsea & topside containing systems
Hose rupture / Failure	Bunker system
Material Defects / Maintenance	Subsea & topside containing systems
Loss of Well Control (drilling operations)	Reservoir & well
Extreme Weather	Topside & Risers

Uncontrolled when Printed



Field Information

A3.5. Schiehallion Field Oil Properties

The manner in which oil will behave once released into the marine environment depends upon its component properties. The properties for the oil have been specified in the table below in accordance with ITOPF category grouping for hydrocarbons. The characteristics of Schiehallion are detailed below.

Specific Gravity at 15°C				
Light <0.8	0.8 – 0.85	0.85 – 0.95	Heavy >0.95	
	Diesel (0.82)	Schiehallion (0.918)		
ITOPF Group I	ITOPF Group II	ITOPF Group III	ITOPF Group IV	
Viscosity (cP) at 12.5°C				
Thin 1.0	220	Medium 5,000	Thick 10,000	
	Schiehallion			
Pour Point at °C				
Light -30°C	Medium 0°C	+3	+20	Heavy +30°C
		Schiehallion		
Asphaltene Content - % Age Weight				
0.06 unlikely to emulsify	0.36	0.5 may form an emulsion	0.6 Stable emulsion	0.9
	Schiehallion			

A3.6. Oil Characteristics and Fate of Oil

Another key contributing factor influencing the ultimate fate of oil is the various weathering processes that may be brought to bear. Each oil weathers differently so an understanding of this relationship and the impact it may have on the oil's properties is important when determining an appropriate strategy. Schiehallion crude has been analysed and a description of the anticipated behaviour detailed in the following tables.

Uncontrolled when Printed

Offshore Oil Pollution Emergency Plan - Schiehallion

A3.6.1 Schiehallion Crude

Fate of Oil

The specific gravity of oil is its density in relation to pure water. Most oils are lighter than water, which has a specific gravity of 1. Schiehallion has a specific gravity of 0.918 suggesting that the oil is likely to be neutrally buoyant, especially in winter months. This can have repercussions on mechanical recovery of the spilled oil at sea.

There will be very low evaporative losses; circa 3-10% after 1 day at sea under wind speeds from 4-30kts, after 4 days 6-16%. Evaporation is dependant on wind speeds. Very rapid water uptake rate especially with higher wind speeds. Maximum water content is 70-75%.

Asphaltene content indicates the oils' ability to absorb water (emulsification). Schiehallion Crude has a low asphaltene content of 0.36% indicating that water in oil emulsions are very unlikely to form.

Using the ITOPF classification key for oil types, Schiehallion export fluid has been classified as Group III oil.

A3.6.2 Diesel Oil

Fate of Oil

Diesel has very high levels of light ends, evaporating quickly on release. The low asphaltene content prevents emulsification, reducing its persistence in the marine environment. Due to its characteristics and subsequent behaviour when released, diesel oil is not considered to offer a significant threat to the environment.

Receiving Environment

Annex 4. Receiving Environment

A4.1. Environmental & Commercial Sensitivities

This section contains a summary of the environmental sensitivities, on a seasonal basis, in the immediate vicinity of the Schiehallion facility. This information will be supported by actual observations from the site and used by the onshore support team when determining response strategies with the relevant external agencies.³

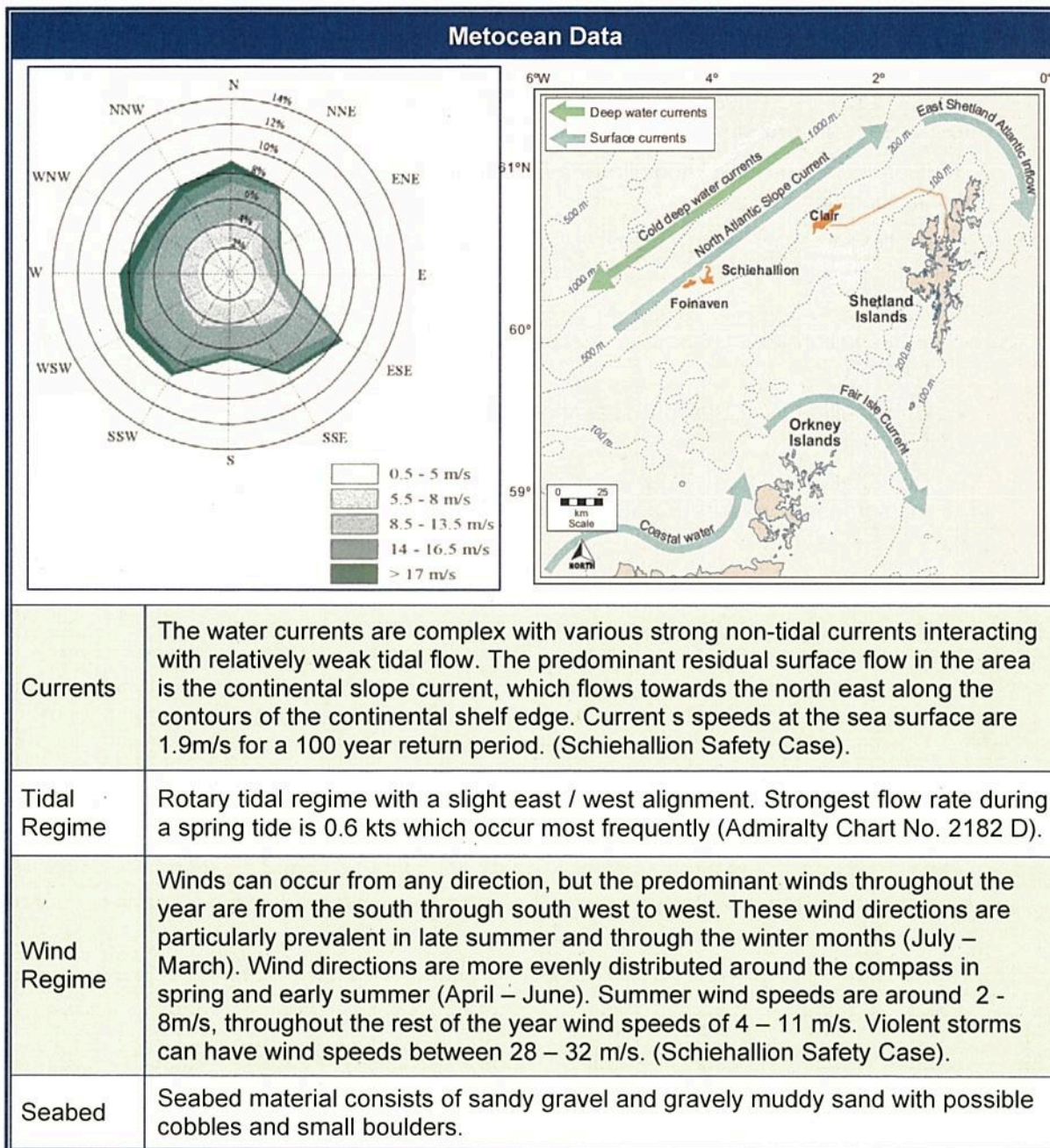
Environmental & Commercial Sensitivities Matrix. Coastal and Marine Resource Atlas (CMRA)												
Receptor	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Seabirds	Seabird species present in the West of Shetland area include: fulmars; gannets; arctic skuas; great skuas; shags; kittiwakes; razorbills; guillemots; arctic terns; leach's storm petrels and puffins. JNCC seabird vulnerability indicates the following sensitivities within the immediate area of Schiehallion.											
	Key:	1	2	3	4	1 = Very High, 4 = Low Vulnerability, Blank = No Data						
	Block 204/15	3	4	2	4	2	3	3	3	2	3	3
Block 204/16				3	3		2	4	4		4	4
Block 204/20	2	4	2	3	2	2	3	3	2	3	3	4
Block 204/21				2	2	2	2	4	4		3	4
Block 204/25		3	3	3	3		2	3	3		3	4
Fisheries	Commercial Fishing Effort: Demersal fishing effort in the vicinity of the installation is relatively low compared with other areas of the UKCS. Nursery: The area is a nursery area for Norway pout, blue whiting, & mackerel. Nursery not given as monthly indication.											
	Key:	S	Spawning	M	Migratory	No Data						
	Norway pout	M		S	S	S/M	M	M			M	M
Mackerel	S	S	S	S	S	S	S					
Sandeels	S	S									S	S
Blue Whiting				S	S	S						
Greater Silver Smelt	S	S	S	S	S	S	S	S	S	S	S	S
Cetaceans	The offshore waters surrounding the Shetland and Faroe islands are fairly rich and diverse in cetacean populations. Key to observations per hour.											
	Key:	1	High	2	Medium	3	Low	No Data				
	Whale:- Fin	3	3	3	3	3	2	2	2	2	3	3
- Humpback	3	3	3		3	1	1	2	1		3	3
- Minke	3	3	2	3	2	1	1	1	2	2	3	3
- Blue	3	3	3	3	3	2	2	2	2	2	3	3
- Pilot		3	3			2	1	1	2	2		
- Killer	3	3	3	3	3	3	1	1	2	2	3	3
- Sel					3	1	2	1	2	3		
- Sperm	3	3	3	2	1	2	2	1	1	2	3	3
Dolphin:- Risso's			3	3	3	2	2	1	1	2	2	2
- White-sided	3	3	2	2	2	2	2	1	1	2	2	3
Bottlenose	3	3	3	2	3	3	3	2	2	3	3	3
White-Beaked	3	3	2	3	2	1	1	1	2	2	3	3
Commercial Shipping	Fishing vessels make up the majority of the traffic, other traffic sighted near the Schiehallion vicinity include cargo, tanker, supply and seismic vessels.											

³ In the event of a spill, actual sensitivities will be advised on the day via statutory authorities.

Offshore Oil Pollution Emergency Plan - Schiehallion

A4.2. Metocean Data

Surveys and observations from the West of Shetland describe the key metocean features as follows.



Uncontrolled when Printed



Modelling

Annex 5. Modelling Outputs

A5.1.1 Stochastic Modelling

This section identifies the two worst case spill scenarios in order to establish their potential impact within the marine environment. The oil types represent oils from the largest as well as the most persistent hydrocarbons that may be released. The selected scenarios cover spills from production operations as well as drilling. The results have been used to ensure that BP's response capability aligns with the response requirements as stipulated by DECC.

Additional deterministic modelling has been undertaken and is detailed within the justification document.

The following stochastic models were run and illustrate % probability of surface oiling. An explanation for the figures used is detailed within the justification document.

- Schiehallion Well Blowout scenario: loss of 133m³/h for 2160 hours (90 days - OSCAR).
- Schiehallion Well Blowout scenario: loss of 133m³/h for 240 hours (10 days - OSIS).
- Schiehallion Cargo Tank Rupture: loss of 25,036m³ Schiehallion crude, instantaneous release (OSIS).

Uncontrolled when Printed