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**Equinor Contract no:**
4503592415

**Project title:**
**Snorre Expansion Project**

**Document title:**
Bundle Tow Notification

**Document no.:**
EN0095-ENG-00082

**Rev.:**
03

**Total Number of Pages:**
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| 02         | 22/03/2019 | Update: Section 2. Distribution List  
Section 4. Offshore Activity Schedule |
| 03         | 25/04/2019 | Update: Section 2. Distribution List  
Section 4. Offshore Activity Schedule |
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### APPENDIX A.

**DRAWINGS**

### APPENDIX B.

**CHECKLIST**
1. **INTRODUCTION**

The Snorre field is located within blocks 34/4 and 34/7 in the Tampen area, 150km West of Florø, in a water depth of 300 – 375m. Enhanced recovery at Snorre is demanding with complex subsurface combined with limited capacity in existing facility infrastructure. Equinor has worked to define a profitable field development concept at Snorre to increase the recovery through the Snorre Expansion Project – SEP (Previously named SN2040).

The SEP consists of 6 subsea templates, each with 4 wells and functionality both for production and water-alternating-gas (WAG) injection. The templates will be installed in the West, East and North sections of the Snorre reservoir, with all 6 templates tied-back to the Snorre A TLP.

**Figure 1-1: Conventional Field Layout Solution**

The Snorre Expansion Project features 3 proprietary bundles, serving the West, East and North templates respectively. These bundles will provide the link between the 6 new templates and the Snorre A TLP, each housing all flowlines and controls hardware necessary for full field operation.

The Snorre A TLP will be expanded via riser hang-off module to facilitate installation of production, water and gas injection risers, as well as umbilicals for services to / from the subsea templates. The SEP development also includes a new gas import pipeline from Gullfaks A for gas injection purposes, tied-into the existing subsea SNA-SNB 8” gas line. Target first oil production from the Snorre Expansion Project is expected from January 2021, with production until 2040 as the base case.
1.1 BUNDLE OPERATIONS OVERVIEW

The bundle is fabricated at Subsea 7’s land based fabrication yard North of Wick, Caithness on the North East Coast of Scotland.

After completion of the fabrication and testing, the bundle is launched into the sheltered Sinclair’s Bay North of Wick. After launch the bundle will be towed in Off Bottom Tow Mode (OBTM) to an area about 40km along the tow route where, submerged weight checks will be carried out to determine if fine-tuning of the bundle submerged weight is required.

Once it has been confirmed that the submerged weight is within specified tolerances, the tow will re-commence in OBTM and CDTM (controlled-depth tow method). During the tow, the bundle towheads are suspended between two lead tugs and a trailing tug, the bundle profile configuration is monitored by an acoustic telemetry system controlled from the RSV command vessel. The tow takes place along a pre-surveyed route.

With the tow approaching Parking Area C the tow speed is reduced and the bundle is lowered towards the seabed within a pre-selected landing area in Off Bottom Mode (OBM) at a height of approximately 5m above the seabed. The tugs will then reconfigure and continue the tow to Parking Area D in OBTM.

With the tow approaching Parking Area D the tow speed is reduced and the bundle is brought to a stop, in the pre-selected landing area. The bundle can then be easily manoeuvred into its final position in the installation area. The total length of the tow configuration including bundle and tow vessels will be approximately 8.6 km.

1.2 SCOPE OF DOCUMENT

This document gives information for the launch, tow and installation of the Bundle, see Section 4 for schedule, and is issued to all parties that might be affected by the tow operations. The pipeline bundle will be transported using the Off Bottom Tow Mode (OBTM) and Controlled Depth Tow Method (CDTM).

Details of the field layout and project work scope can be found within the overall content of the document and the Drawings in Appendix I.

1.3 RECORDS AND RESPONSIBILITIES

Records of notifications will be maintained. Schedule notifications prior launch will be the responsibility of the tow master who will control the notifications produced and will update contact information if required when feedback is received. During bundle towing operations the Offshore Manager will be responsible for bundle crossing notifications and shall record details of all notifications produced.

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1.4 DEFINITIONS

**Land Point**
The tow route datum (KP 0) is the apex of the seaward gable end of the fabrication shop at the Wester Site construction facility of Subsea 7.

**Launch Area**
A pre surveyed area in Sinclair’s bay, adjacent to Wester Site, into which the bundle will be launched. After launch submerged weight check will be performed and if necessary trimming of the bundle will take place.

**Tow Route**
The bundle will follow the specified tow route comprising of a pre-surveyed 1200m (KP 10 - KP 70) / 800m (KP 70 - EOT) wide corridor from Sinclairs Bay to the field. As part of the contingency procedures, it may be necessary to set down the bundle during the tow operation. Any areas not suitable for bundle set down, incl. pipeline crossings, will be identified in the Bundle Tow Procedure.

**Parking Area**
A 1 km wide x 8 km long pre surveyed area where the bundle will be lowered to the seabed in order to perform pre installation activities.

**Transit Zone**
A pre surveyed area between the Parking and Installation Areas

**Installation Area**
A 100m wide x 8 km long pre surveyed area where the bundles will be towed in off-bottom mode until final positioning and carrier flooding.

**Project Support Boat (PSB)**
This is a small, high speed, shallow draft vessel used to transfer personnel and small supplies from Wick and Keiss harbours in Sinclair’s Bay to the marine spread as required.

**Work Vessel (WV)**
This is a small, shallow draft vessel used to deliver the launch pennants to Sinclair’s Bay. This vessel will be used to prepare all launch rigging within Sinclair’s Bay prior to the arrival of the leading tugs. This vessel will be required to assist with the launch activities of the bundle operating in the shallow waters of the bay.

**Lead Tugs (LTs)**
The Lead Tugs will provide the required pull force to launch the bundle into the confined waters of Sinclair's Bay, tow of the bundle and subsequent installation in the field.

**Trailing Tug (TT)**
The Trailing Tug will be required to provide the back-tension during the tow.
ROV Support Vessel (RSV)(Command Vessel)
The RSV is required to provide ROV and survey support during launch, tow and installation of the bundle. It will also assess the bundles submerged weight and define and implement the trimming requirements. During tow, the RSV will monitor the bundle configuration.

Guard Vessel (GV)
The Guard Vessel will issue navigational warnings and provide guard duties during the bundle tow.

1.5 ABBREVIATIONS

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<tr>
<td>CDTM</td>
<td>Controlled Depth Tow Method</td>
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<tr>
<td>CPI</td>
<td>Client Provided Item</td>
</tr>
<tr>
<td>DGPS</td>
<td>Differential Global Positioning System</td>
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<tr>
<td>DSC</td>
<td>Digital Selective Calling</td>
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<tr>
<td>ED</td>
<td>European Datum</td>
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<td>EOP</td>
<td>End of Parking Area</td>
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<tr>
<td>EOT</td>
<td>End of Tow</td>
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<td>IMO</td>
<td>International Maritime Organisation</td>
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<td>HIRA</td>
<td>Hazard Identification &amp; Risk assessment</td>
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<td>HW</td>
<td>High Water</td>
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<td>KP</td>
<td>Kilometre Point</td>
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<td>Lowest Astronomical Tide</td>
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<td>Long Base Line</td>
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<td>LP</td>
<td>Land Point</td>
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<tr>
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<tr>
<td>nm</td>
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<td>Off Bottom Mode</td>
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<tr>
<td>OBTM</td>
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<tr>
<td>ROV</td>
<td>Remotely Operated Vehicle</td>
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<td>STT</td>
<td>Skene Tie-in Towhead</td>
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<td>TP</td>
<td>Turning Point</td>
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<tr>
<td>USBL</td>
<td>Ultra Short Base Line</td>
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<tr>
<td>UTM</td>
<td>Universal Transverse Mercator</td>
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<tr>
<td>VHF</td>
<td>Very High Frequency</td>
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<tr>
<td>WGS</td>
<td>World Geodetic System</td>
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2. DISTRIBUTION LISTS

2.1 UK AUTHORITIES AND ORGANISATIONS

Marine Scotland – Marine Planning and Policy
Scottish Government Area 1A South
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Edinburgh
EH6 6QQ

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MS.SpillResponse@gov.scot     Fax: 01312 447163

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Attn: Paul Bancks
paul.bancks@crownestatescotland.com
Alastair Campbell
Alastair.Campbell@bidwells.co.uk

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Harbour Office          Tel: 01955 602030
The Harbour            Fax: 01955 605936
Wick
Caithness  KW1 5HA

Attn: Malcolm Bremner (Harbour Master)
malcolm.bremner@wickharbour.co.uk
office@wickharbour.co.uk

Maritime and Coast Guard Agency
4th Floor Marine House          Tel: 01224 592334
Blaikies Quay            Fax: 01224 575920
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zone3@hmcg.gov.uk
Ministry of Defence UK (Navy)  
Hydrographic Office  
Admiralty Way  
Taunton,  
Somerset  TA1 2DN  
Attn: Sharon Cridland  
Tel: 01823 484444  
Sharon.Cridland@ukho.gov.uk

Ministry of Defence UK (Navy)  
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Admiralty Way  
Taunton,  
Somerset  TA1 2DN  
navwarnings@ukho.gov.uk

Navigation Department  
Northern Lighthouse Board  
84 George Street  
Edinburgh  EH2 3DA  
Attn: Peter Douglas Navigation Manager  
Gillian Burns  
Tel: 01314 733100  
Tel: 01314 733196  
navigation@nlb.org.uk

Scottish Fishermen’s Federation  
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Attn: Sheryl Gove  
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ops@sff.co.uk

SeaFish Industry Authority  
Origin Way  
Europark  
Grimsby  
N.E. Lincolnshire  DN37 9TZ  
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kingfisher@seafish.co.uk

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Fax: +47 5274 5001
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post@sjofartsdir.no

**Fellesoperativt Hovedkvarter**
(SJØOPS)
Tel: +47 7553 6298
Fax: +47 7553 6354
Attn: Kystovervåkningssentralen
csc@oss.mil.no

**Fiskeridirektoratet**
(Norwegian Fisheries Directorate)
Tel: +47 8003 0179
Fax: +47 5523 8090
postmottak@fiskeridir.no
Attn: Gjermund Langedal
gjermund.langedal@fiskeridir.no

**Sør-Norges Trålerlag «Fiskebåt»**
Sørhauggt. 128
5527 Haugesund
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espen@fiskebat.no
fiskebat@fiskebat.no

**Norges Fiskarlag**
Havnegata 9
7010 Trondheim
fiskarlaget@fiskarlaget.no

**Kartverket, Sjødivisjonen**
(Norwegian Hydrographics Services)
Tel: +47 08700
Fax: +47 5185 8701
Efterretninger for Sjøfarende(Notices to Mariners)
efs@kartverket.no
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Tel: 01224 352500

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Tel: 01224 352672

Attn: Steve Allan (Principle Pipeline Eng)
Steven.Allen@repsolsinopecuk.com
Tel: 01224 353168

Attn: Gemma Crawford (Senior Legal Advisor)
Gemma.Crawford@repsolsinopecuk.com
Tel: 01224 352501

Attn: Cliff Ho (Pipeline Technical Authority)
Cliff.ho@Shell.com
ukdcc-operator@shell.com
ukdcc-supervisor@shell.com
Supervisor:
Emergency:
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Tel: 01224 884445

Shell Exploration & Production
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Attn: Mr. Sandy Smith    EPE-P-EI
Sandy.smith@Shell.com
Cliff Ho (Pipeline Technical Authority)
Cliff.ho@Shell.com
ukdcc-operator@shell.com
ukdcc-supervisor@shell.com
Supervisor:
Emergency:
Tel: 01224 882820
Tel: 01224 884445

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<table>
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<tr>
<th>Company</th>
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<tr>
<td><strong>PX Limited.</strong></td>
<td>Tel: 01224 241300</td>
</tr>
<tr>
<td>Building One</td>
<td>Fax: 01224 241370/71</td>
</tr>
<tr>
<td>Balmoral Business Park</td>
<td></td>
</tr>
<tr>
<td>Aberdeen. AB12 3JG</td>
<td></td>
</tr>
<tr>
<td>Attn: Mr. Vijay Kamate (Sr.</td>
<td>Tel: 01224 241342</td>
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<tr>
<td>Subsea &amp; Pipeline Eng)</td>
<td>Mob: 07970 211010</td>
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<tr>
<td><a href="mailto:Vijay.kamate@pxlimited.com">Vijay.kamate@pxlimited.com</a></td>
<td></td>
</tr>
<tr>
<td>24 Hour Emergency &amp; Notification Contacts</td>
<td></td>
</tr>
<tr>
<td>St Fergus Terminal Control Room</td>
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<tr>
<td><a href="mailto:Sfgp_controlroom@pxlimited.com">Sfgp_controlroom@pxlimited.com</a></td>
<td>Fax: 01779 838878</td>
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<tr>
<td><a href="mailto:Sfgp_supershift@pxlimited.com">Sfgp_supershift@pxlimited.com</a></td>
<td>Tel: 01779 442207</td>
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<td><strong>Total E&amp;P UK Ltd</strong></td>
<td>Tel: 01224 297000</td>
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</tr>
<tr>
<td>Tarland Rd, Skene, Westhill, AB32 6JZ</td>
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</tr>
<tr>
<td>Attn: David Colliard</td>
<td>Tel: 01224 298172</td>
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<td><a href="mailto:david.colliard@total.com">david.colliard@total.com</a></td>
<td>Mob: 07976 900204</td>
</tr>
<tr>
<td>Mark Grove Smith</td>
<td></td>
</tr>
<tr>
<td><a href="mailto:mark.grove-smith@total.com">mark.grove-smith@total.com</a></td>
<td></td>
</tr>
<tr>
<td><strong>Equinor</strong></td>
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</tr>
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<td>Equinor ASA, 4035 Stavanger</td>
<td></td>
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<tr>
<td>Attn: Kenneth Jakobsen</td>
<td>Mob: +47 9958 6150</td>
</tr>
<tr>
<td><a href="mailto:kejac@equinor.com">kejac@equinor.com</a></td>
<td></td>
</tr>
<tr>
<td>Emergency Response Leader</td>
<td>Tel: +47 9486 2340</td>
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<tr>
<td><a href="mailto:TNDUTY@equinor.com">TNDUTY@equinor.com</a></td>
<td>Tel: +47 9028 5997</td>
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<tr>
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<td></td>
</tr>
<tr>
<td><strong>GASSCO AS</strong></td>
<td>Tel: 0047 5281 2500</td>
</tr>
<tr>
<td>Bygnesevegen 75, 4250 Kopervik</td>
<td>Fax: 0047 5281 2946</td>
</tr>
<tr>
<td>Norway</td>
<td></td>
</tr>
<tr>
<td>Attn: Mr David R de Miranda (</td>
<td>Tel: 0047 5281 2677</td>
</tr>
<tr>
<td>Asset Manager-UK Pipelines)</td>
<td>Mob: 0047 9057 0685</td>
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<tr>
<td><a href="mailto:drm@gassco.no">drm@gassco.no</a></td>
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<tr>
<td>24 Hour Emergency &amp; Notification Contacts</td>
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<tr>
<td><a href="mailto:tcc@tccgassco.no">tcc@tccgassco.no</a></td>
<td>Tel: 0047 5281 2896</td>
</tr>
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<td>Fax: 0047 5281 2947</td>
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2.4 BUNDLE TOW ROUTE PIPELINE CROSSINGS

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<td>PL11 30” Oil, Piper/Claymore Tee to Flotta</td>
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<td>SHELL</td>
<td>PL2 36” Gas, Brent A to St Fergus (FLAGS)</td>
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<td>PX LIMITED</td>
<td>PL2764 30” Gas, Export (SIRGE) Firths Voe to MCP01</td>
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<td>PL336 24” Gas, Alwyn to Frigg</td>
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<td>PL 1820 Dunbar to Nuggets NI Manifold Chemical</td>
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<td>PL 1808 12” Gas, Dunbar to Nuggets NI Manifold to NAB</td>
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<td>PL 1809 3” Chemical, NAB to Nuggets NI</td>
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2.5 ADDITIONAL NOTIFICATION REQUIREMENTS

If further notification is required in addition to that described above, please send a letter or an email describing the requirements with contact name and phone number and e-mail address:

Attn: Bundles Towmasters  Steve Close / Nigel Sly
Equinor Snorre Bundle Project
Subsea 7 (East Campus)
1st Floor, West Wing
Prospect Road,
Arnhall Business Park,
Westhill,
Aberdeenshire.
AB32 6FE.

e-mail: bundles.towmasters@subsea7.com
Office Direct Tel: +44 (0) 1224 527685
+44 (0) 1224 526529

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seabed-to-surface
### 2.6 FUTURE CORRESPONDENCE

Any significant amendments to the offshore schedule detailed in Section 4 (Offshore Activity Schedule) of this notification will be updated by e-mail to the relevant recipients, rather than re-issuing the full notification.

Furthermore, when the decision to commence the bundle launch has been taken, recipients will be updated by e-mail. This will normally be on the day leading up to the bundle launch.

### 3. TRANSPORT OF BUNDLE

#### 3.1 GENERAL

Subsea 7 has towed numerous pipeline bundles, which have included pipeline crossings and negotiating subsea structures.

Detailed progressive and innovative engineering, combined with experience gained over the years has resulted in a reliable method to tow pipeline bundles in a controlled configuration and depth. Detailed procedures are developed to cover the tow activities, including the actions to be taken if an emergency situation should occur.

All operational procedures such as the Launch, Tow and Installation Procedures will be subject to a HIRA before being implemented.
3.2 METHODS OF TOWING – OBTM & CDTM

I. Off Bottom Tow Mode

The principle of OBTM involves the transportation of a pipeline bundle between lead tug(s) and a trail tug. To maintain control during tow the tugs will adjust bollard pull and tow wire lengths to raise the leading and trailing towheads between 5 and 30m above the seabed, once towheads are raised the lead tugs increase power and the pipeline tow commences. During tow only the long chains will come into contact with the seabed.
II. Controlled Depth Tow Method

The principle of CDTM involves the transportation of a pipeline bundle suspended between lead tug(s) and a trail tug. To maintain control during the tow, the bundle will have been designed and constructed within specific tolerances with respect to its submerged weight. In order to achieve sufficient buoyancy for the bundle, the pipeline, control lines etc. are placed within a carrier pipe. Subsequently ballast chains are attached to provide additional weight to weigh the bundle down in order to prevent it from floating on surface. At rest, the bundle floats in off bottom mode, approximately 5 metres above the seabed with part of the chains resting on the seabed.

By controlling the tow speed in combination with the tension maintained by the trailing tug at the trailing towhead, the bundle configuration and its deflections are kept under control during the tow. The essential parameters are monitored during the tow. Parameters will be adjusted as necessary to maintain the bundle configuration within the water column, clear of the seabed.

During tow, the drag on the chain creates a 'lift force', and so reduces the bundle submerged weight. This lift force will result in a complete lift off of the chains from the seabed into CDTM mode.
### 3.3 TOW ROUTE

See Drawing EN0095-DR-FA-43001 in Appendix I

<table>
<thead>
<tr>
<th>Category</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of Tow Route</td>
<td>510km</td>
</tr>
<tr>
<td>Width of Surveyed Tow Route</td>
<td>1200m</td>
</tr>
<tr>
<td></td>
<td>800m [KP 70 – KP 510]</td>
</tr>
<tr>
<td>Minimum Water Depth</td>
<td>59m [KP 10 – EOT]</td>
</tr>
<tr>
<td>Maximum Water Depth</td>
<td>320m</td>
</tr>
<tr>
<td>Total Pipeline Crossings</td>
<td>17</td>
</tr>
<tr>
<td>Total Cable Crossings</td>
<td>8</td>
</tr>
<tr>
<td>Number of Turning Points</td>
<td>11</td>
</tr>
</tbody>
</table>

### 3.4 TOW ROUTE DESCRIPTION

The seabed gradually slopes from the Land Point to approximately 59m at KP 8.0 of the Launch Area. From the end of the Launch Area to the End of Tow the water depth varies between 59 and 320m.

The route is selected to provide an optimal approach to the field combined with a minimum number of pipeline crossings.

The tow route has been surveyed to confirm the bathymetry, positions of existing pipelines and to highlight obstructions.

When the tow arrives in the field, the bundle will be in Off Bottom Mode and pulled into the designated Parking Area “D”. The bundle will come to rest approximately 5m above the seabed. The Parking Area is situated to the South of the installation area see drawing EN0095-DR-AC-43002 in Appendix I

### 3.5 LAUNCH

After completion of the onshore fabrication and testing, the bundle will be launched into the relatively sheltered Sinclair’s Bay, near Wick, Northern Scotland, using lead tug(s).

A wire rope assembly will connect the Tug(s) to the lead towhead. The tug(s) propulsion will provide the required pull force to launch the bundle into Sinclair’s Bay.

After launch, the bundle will float in Sinclair’s Bay at a pre-determined height above the seabed with some of the chain links resting on the seabed. The Bundle will then be towed in OBTM out of Sinclair Bay to a position 30~40kn down the tow route. Bundle submerged weight checks will be carried out at this point to determine if fine-tuning of weight is required.

Details of the launch area are displayed in the attached drawing no: GWS001-0005-DR-AA-43001 in Appendix I.
3.6 **TOW**

The vessels involved in the tow are:-
- 2 x Leading Tugs (LT1 & LT2)
- 1 x Trailing Tug (TT)
- 1 x ROV Support Vessel (RSV)
- 1 x Guard Vessel

The Offshore Manager on the RSV is overall responsible for the operation from commencement of the launch to completion of installation in the field. The Offshore Manager delegates the direct control of the tow to the Tow Master on the RSV who directs all vessels in the tow spread.

During tow, the bundle profile will be monitored within the water column and where necessary adjusted by alteration of tug pull forces, and / or tow wire lengths to ensure sufficient clearance of the bundle from the seabed and sea surface, whilst endeavoring to maintain a minimum distance above seabed of 20 metres at all times. If the bundle is proving difficult to control OBTM will be resumed.

The RSV will monitor depth and internal pressure of the pipeline bundle during the tow, by way of an acoustic link to transponders along the bundle. The RSV is normally positioned 800m behind the leading towhead and standing off 300-500m to the side of the bundle.

The bundle depth will be measured at approximately 800m intervals along its length by pressure transducers, primary positioning from LBL depths with USBL cross check of individual xyz, measuring the hydrostatic pressure at each location. At trailing end of the bundle, gyros are installed to provide a plan view of that section of the bundle. Information is passed along a data highway cable within the bundle, to each transponder, which can relay information when interrogated.

The Guard Vessel will sail ahead and to one side of the Leading Tugs, transmitting the navigational warnings and will warn off any approaching shipping in order to avoid close quarter situations.

Bundle will be set-down in Temporary Parking Area “C” to reconfigure tugs in 130m of water 32nm (60km) from the final destination.

Once Tugs are reconfigured the tow will proceed in OBTM to the Installation Parking Area “D”.

Upon arrival in the field, the tow speed is reduced and the bundle is brought to a stop in the Installation Parking Area suspended approximately 5m off the seabed by its own buoyancy with only the ballast chains in contact with the seabed.

3.7 **INSTALLATION**

With the bundle tow completed and the bundle stationary in off-bottom mode in the parking area, the bundle status will be checked, installation activities completed until the bundle is ready to install.
4. OFFSHORE ACTIVITY SCHEDULE

Bundle offshore schedule:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Duration [dd hh]</th>
<th>Start [dd/mm/yyyy]</th>
<th>Finish [dd/mm/yyyy]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bundle Launch</td>
<td>01 00</td>
<td>30/05/2019</td>
<td>31/05/2019</td>
</tr>
<tr>
<td>OBT to KP67</td>
<td>00 12</td>
<td>31/05/2019</td>
<td>31/05/2019</td>
</tr>
<tr>
<td>SWC</td>
<td>01 00</td>
<td>31/05/2019</td>
<td>01/06/2019</td>
</tr>
<tr>
<td>OBTM/CDTM to Parking Area C</td>
<td>01 16</td>
<td>01/06/2019</td>
<td>03/06/2019</td>
</tr>
<tr>
<td>OBT Parking Area C to Installation Parking Area</td>
<td>00 13</td>
<td>03/06/2019</td>
<td>04/06/2019</td>
</tr>
<tr>
<td>Bundle Installation</td>
<td>01 18</td>
<td>04/06/2019</td>
<td>05/06/2019</td>
</tr>
</tbody>
</table>

5. NAVIGATION SAFETY PROCEDURES

5.1 GENERAL

The procedure set out below is in accordance with the obligatory IMO "International Regulations for Preventing Collisions at Sea" and good seamanship practice.

5.2 LOOK-OUT AND RADAR WATCH

A continuous lookout and radar watch will be kept at all times on the bridge of all tow fleet vessels.

Sighting of vessels and/or obstructions, which are deemed to conflict with the bundle tow spread, must immediately be reported to the officer on duty, who will report to the Tow Master on the Command Vessel.

5.3 LIGHT SIGNALS

All tow fleet vessels will show the appropriate lights and day shapes as required in accordance with the International Regulations for Preventing Collisions at Sea.

In addition to the mandatory navigation lights, the tugs will be equipped with a search light, capable of searching 360 degrees of arc. This is to indicate the prohibited area in between them to any vessel making a passage attempt or any vessel on close quarter situations.
5.4 **SOUND SIGNALS**

All tow fleet vessels will give the obligatory sound signals in accordance with the International Regulations for Preventing Collisions at Sea.

5.5 **RADIO**

All tow fleet vessels will have VHF marine radio, having Channel 70 (DSC), 16 and dual watch, with a maximum power output of 25 Watt, reducible to 1 Watt.

During tow, the Lead Tug or Guard vessel will announce minimum every hour on VHF Channel 16 after the initial DSC alert on Channel 70 that a navigation warning will be broadcast on VHF Channel 06.

The navigational warning on VHF Channel 06 will give the following information to all ships:

- Name/call sign of vessel
- Position/speed/course at specific time
- Destination
- Character of tow/length of tow spread
- Vessels requested to give a wide berth
6. **ADDITIONAL PIPELINE / CABLE CROSSING INFORMATION**

<table>
<thead>
<tr>
<th>No</th>
<th>PIPELINE</th>
<th>OPERATOR</th>
<th>KP</th>
<th>EASTING</th>
<th>NORTHING</th>
<th>LATITUDE</th>
<th>LONGITUDE</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>SHEFA-2 BANFF TO MANSE BAY</td>
<td>FOROYA TELECOM</td>
<td>32.261</td>
<td>173240</td>
<td>6490827</td>
<td>58° 26' 00.874'' N</td>
<td>002° 36' 05.248'' W</td>
</tr>
<tr>
<td>2</td>
<td>PL11 30&quot; OIL PIPELINE PIPER TO FLOTTA</td>
<td>REPSON SINOPEC</td>
<td>106.598</td>
<td>243114</td>
<td>6512768</td>
<td>58° 40' 36.0146'' N</td>
<td>001° 26' 00.326'' W</td>
</tr>
<tr>
<td>3</td>
<td>PL2 36&quot; GAS PIPELINE FLAGS BRENT A TO ST FERGUS</td>
<td>SHELL</td>
<td>142.397</td>
<td>275209</td>
<td>6528624</td>
<td>58° 50' 11.898'' N</td>
<td>000° 53' 49.867'' W</td>
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<tr>
<td>4</td>
<td>PL2764 30&quot; GAS EXPORT (SIRGE) FIRTHS VOE TO MCP01</td>
<td>PX LTD</td>
<td>176.768</td>
<td>306357</td>
<td>6543150</td>
<td>58° 58' 55.257'' N</td>
<td>000° 22' 16.456'' W</td>
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<tr>
<td>5</td>
<td>PROPOSED TELECOM CABLE, NIGG / NORWAY</td>
<td>UNKNOWN</td>
<td>185.830</td>
<td>314446</td>
<td>6547232</td>
<td>59° 01' 19.191'' N</td>
<td>000° 14' 03.020'' W</td>
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<tr>
<td>6</td>
<td>CABLE TAT 10B</td>
<td>DEUTSCHE TELEKOM AG</td>
<td>190.578</td>
<td>318408</td>
<td>6549842</td>
<td>59° 02' 50.308'' N</td>
<td>000° 10' 02.734'' W</td>
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<tr>
<td>7</td>
<td>ALANTIC CROSSING AC1</td>
<td>GLOBAL CROSSING</td>
<td>225.500</td>
<td>338284</td>
<td>6578182</td>
<td>59° 18' 34.170'' N</td>
<td>000° 09' 27.121'' E</td>
</tr>
<tr>
<td>8</td>
<td>TAT 14(K) BLAAJBERG TO 20 WEST</td>
<td>SPRINT</td>
<td>238.594</td>
<td>344710</td>
<td>6589591</td>
<td>59° 24' 51.273'' N</td>
<td>000° 15' 43.281'' E</td>
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<td>9</td>
<td>PROPOSED TELECOM CABLE, SHETLAND- BRUCE FIELD</td>
<td>UNKNOWN</td>
<td>290.594</td>
<td>371388</td>
<td>6634213</td>
<td>59° 49' 25.058'' N</td>
<td>000° 42' 16.119'' E</td>
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<td>10</td>
<td>PL1820 CHEMICAL DUNBAR- NUGGETS N1 MANIFOLD</td>
<td>TOTAL</td>
<td>385.976</td>
<td>430848</td>
<td>6708500</td>
<td>60° 30' 16.957'' N</td>
<td>001° 44' 21.432'' E</td>
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<td>11</td>
<td>PL1808 12&quot; GAS NUGGETS N MANIFOLD TO NAB</td>
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<td>430875</td>
<td>6708529</td>
<td>60° 30' 17.915'' N</td>
<td>001° 44' 23.153'' E</td>
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<td>12</td>
<td>PL1809 3&quot; CHEMICAL NAB TO NUGGETS N1</td>
<td>TOTAL</td>
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<td>430875</td>
<td>6708529</td>
<td>60° 30' 17.915'' N</td>
<td>001° 44' 23.153'' E</td>
</tr>
<tr>
<td>13</td>
<td>PL336 24&quot; GAS ALWYN TO FRIGG</td>
<td>PX LTD</td>
<td>390.096</td>
<td>433637</td>
<td>6713532</td>
<td>60° 31' 56.626'' N</td>
<td>001° 47' 20.599'' E</td>
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<tr>
<td>14</td>
<td>PLU 2172 CHEMICAL DUNBAR TO FORVIE MANIFOLD UMBILICAL</td>
<td>TOTAL</td>
<td>392.378</td>
<td>435182</td>
<td>6713211</td>
<td>60° 32' 51.803'' N</td>
<td>001° 48' 59.907'' E</td>
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<tr>
<td>15</td>
<td>PL2169 17.5&quot; CONDENSATE FORVIE MANIFOLD TO NAB PLATFORM</td>
<td>TOTAL</td>
<td>394.312</td>
<td>436492</td>
<td>6714634</td>
<td>60° 33' 38.546'' N</td>
<td>001° 50' 24.171'' E</td>
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<tr>
<td>16</td>
<td>P31 STATPIPE 30&quot; GAS</td>
<td>GASSCO AS</td>
<td>442.024</td>
<td>466242</td>
<td>6751539</td>
<td>60° 53' 44.302'' N</td>
<td>002° 22' 34.281'' E</td>
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<tr>
<td>17</td>
<td>VALEMON GASSOR 22&quot; GAS</td>
<td>GASSCO AS</td>
<td>452.823</td>
<td>468517</td>
<td>6762063</td>
<td>60° 59' 25.075'' N</td>
<td>002° 24' 58.991'' E</td>
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<tr>
<td>18</td>
<td>VALEMON KONDESDATOR 8</td>
<td>EQUINOR</td>
<td>461.125</td>
<td>468302</td>
<td>6770347</td>
<td>61° 03' 52.755'' N</td>
<td>002° 24' 39.781'' E</td>
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<tr>
<td>19</td>
<td>KVITEBJORN TO VALEMON POWER CABLE</td>
<td>EQUINOR</td>
<td>461.136</td>
<td>468301</td>
<td>6770357</td>
<td>61° 03' 53.081'' N</td>
<td>002° 24' 39.692'' E</td>
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<td>20</td>
<td>GJOA GAS EXPORT 28&quot;</td>
<td>GASSCO</td>
<td>463.970</td>
<td>467835</td>
<td>6773152</td>
<td>61° 05' 23.279'' N</td>
<td>002° 24' 06.883'' E</td>
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<td>21</td>
<td>TAMPNET 1 SORRE- VESLEFRIKK COMMS</td>
<td>TAMPNET</td>
<td>473.333</td>
<td>465303</td>
<td>6783163</td>
<td>61° 10' 13.711'' N</td>
<td>002° 21' 11.969'' E</td>
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<tr>
<td>22</td>
<td>VISUND 14&quot; OIL EXPORT</td>
<td>EQUINOR</td>
<td>479.014</td>
<td>463772</td>
<td>6787632</td>
<td>61° 13' 09.951'' N</td>
<td>002° 19' 25.723'' E</td>
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<tr>
<td>23</td>
<td>VISUND SOR 10&quot; PRODUCTION PIPELINE</td>
<td>EQUINOR</td>
<td>481.790</td>
<td>463263</td>
<td>6790361</td>
<td>61° 14' 37.959'' N</td>
<td>002° 18' 49.707'' E</td>
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<tr>
<td>24</td>
<td>VISUND SOR UMBILICLE</td>
<td>EQUINOR</td>
<td>481.795</td>
<td>463262</td>
<td>6790365</td>
<td>61° 14' 38.086'' N</td>
<td>002° 18' 49.650'' E</td>
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<tr>
<td>25</td>
<td>KNARR 12&quot; GAS EXPORT LINE</td>
<td>GASSCO</td>
<td>499.083</td>
<td>460656</td>
<td>6807455</td>
<td>61° 23' 49.473'' N</td>
<td>002° 15' 41.862'' E</td>
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</table>

Note: At the design speed of 5.0 kts, each pipeline/cable crossing will take approximately 56 minutes.
APPENDIX A.

DRAWINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Drawing Number</th>
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</thead>
<tbody>
<tr>
<td>Overall Field Layout</td>
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</tr>
<tr>
<td>Snorre West General Arrangement</td>
<td>EN0095-DR-CA-10101</td>
</tr>
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<td>Bundle Westersite launch area</td>
<td>GWS001-0005-DR-AA-43001</td>
</tr>
<tr>
<td>Bundle Tow Route</td>
<td>EN0095-DR-FA-43001 Sheet 1 &amp; 2</td>
</tr>
<tr>
<td>Bundle Parking &amp; Installation Area</td>
<td>EN0095-DR-FA-43002</td>
</tr>
<tr>
<td>PIPELINE/CABLE</td>
<td>DESCRIPTION</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>S2 - GCW FIELD TO FCW PLATFORM</td>
</tr>
<tr>
<td>12</td>
<td>GCW - GCW CROSSOVER TO TPU</td>
</tr>
<tr>
<td>13</td>
<td>GCW - FL FLIGTH</td>
</tr>
<tr>
<td>14</td>
<td>GCW - GAS EXPORT</td>
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<tr>
<td>15</td>
<td>GCW - GAS EXPORT</td>
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<td>16</td>
<td>GCW - GCW CROSSOVER TO TPU</td>
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</tr>
<tr>
<td>25</td>
<td>GCW - GCW CROSSOVER TO TPU</td>
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</tbody>
</table>

**Notes:**
- The drawing is to be used in conjunction with sheet 1.
APPENDIX B.

CROSSING CHECKLIST
# Snorre West: Bundle Tow: - Pipeline & Cable Crossing Checklist

<table>
<thead>
<tr>
<th>POINT</th>
<th>PIPELINE</th>
<th>OPERATOR</th>
<th>KP</th>
<th>1) Vessels &amp; Systems Operating Satisfactorily</th>
<th>2) RSV Bundle monitoring system stable</th>
<th>3) Bundle profile and trend acceptable</th>
<th>Initials of Checker</th>
<th>COMMENTS / REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SHEFA-2 SEG 9 Banff to Manse Bay (Cable)</td>
<td>FOROYA TELE</td>
<td>32.3</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Initials</td>
<td>OBTM / CDTM</td>
</tr>
<tr>
<td>2</td>
<td>PL11 30” Oil, Piper/Claymore Tee to Flotta</td>
<td>REPSOL SINOPEC</td>
<td>106.6</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Initials</td>
<td>OBTM / CDTM</td>
</tr>
<tr>
<td>3</td>
<td>PL2 36” Gas, Brent A to St Fergus (FLAGS)</td>
<td>SHELL</td>
<td>142.4</td>
<td>Check</td>
<td>Check</td>
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<td>Initials</td>
<td>OBTM / CDTM</td>
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<tr>
<td>4</td>
<td>PL2764 30” Gas, Export (SIRGE) Firths Voe to MCP01</td>
<td>PX LIMITED</td>
<td>176.8</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Initials</td>
<td>OBTM / CDTM</td>
</tr>
<tr>
<td>5</td>
<td>Proposed Telecom Cable Nigg Bay - North Norway</td>
<td>UNKNOWN</td>
<td>185.8</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Initials</td>
<td>OBTM / CDTM</td>
</tr>
<tr>
<td>6</td>
<td>TAT 10B East Section Nordenery to 01.5° W (Cable)</td>
<td>DEUTSCHE TELEKOM AG</td>
<td>190.6</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Initials</td>
<td>OBTM / CDTM</td>
</tr>
<tr>
<td>7</td>
<td>Atlantic Crossing 1 (AC1) SEG A (Cable)</td>
<td>GLOBAL MARINE</td>
<td>225.5</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Initials</td>
<td>OBTM / CDTM</td>
</tr>
<tr>
<td>8</td>
<td>TAT 14(K) Blabjerg to 20 W (Cable)</td>
<td>SPRINT</td>
<td>238.6</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Initials</td>
<td>OBTM / CDTM</td>
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<tr>
<td>9</td>
<td>Proposed Telecom (Cable) Shetland to Bruce field</td>
<td>UNKNOWN</td>
<td>290.6</td>
<td>Check</td>
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## Standard pipeline crossing notifications (1 hour before and immediately after pipeline crossing)

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