

## **SPECIAL CONDITIONS OF CONTRACT**

### **1 INTRODUCTION**

#### **1.1 General information about the Norwegian Petroleum Directorate**

The Norwegian Petroleum Directorate (NPD) was established in 1972 and is located in Stavanger. NPD's main task is to manage the oil and gas resources on the Norwegian Continental Shelf. The NPD shall contribute to create the greatest possible values for society from the oil and gas activities by means of prudent resource management based on safety, emergency preparedness and safeguarding of external environment.

#### **1.2 Definitions**

All definitions set out in the General Conditions of Contract (the "GCC") shall apply to these Special Conditions of Contract (the "SCC"), except as expressly stated otherwise herein.

### **2 THE SEISMIC ACQUISITION PROGRAMME**

*[To be further detailed based on tender document, tender and subsequent notification by Company.]*

The Survey shall be carried out in the period from August 1<sup>st</sup> to late September / early October 2014. The entire Survey duration is estimated to be up to approximately 2 months.

### **3 DEMAND SPECIFICATION – PERFORMANCE OF THE SEISMIC ACQUISITION PROGRAMME**

#### **3.1 General**

Contractor shall allow for adequate time, at no extra cost to Company, for checkout by Company of all systems (including seismic, navigation/positioning equipment) under operating conditions, i.e. with streamer(s) and energy sources deployed and test shots recorded. A formal start of operations is depended upon a satisfactory checkout.

#### **3.2 Technical specifications**

##### **3.2.1 Data acquisition**

*[To be further detailed based on tender document and tender.]*

##### **Survey parameters:**

Shot (pop) interval:	25 m (depending on selected recording length)
Source depth:	6.0 m or 7.0 m
Streamer active length:	8 km
Streamer depth:	7.0 m (nominal) – 9.0 m (nominal) / and dependent on pre-survey geophysical evaluation & streamer technology
Record length:	9 - 11 Sec. (to be evaluated)
Sampling rate:	2 ms

### **3.2.2 Navigation Specifications**

*[To be further detailed based on tender document and tender.]*

Contractor is responsible for navigation supply. Navigation data shall be processed by Contractor in order to produce final positions for each source and trace.

The centre of sources shall at all times be determined better than +/- 5 m. Receivers shall at all times be determined better than +/- 10 m. Both figures shall refer to a confidence level of 95%.

### **3.2.3 Additional Services**

*[To be further detailed based on tender document and tender.]*

## **3.3 Data Quality**

*[To be further detailed based on tender document and tender.]*

Contractor shall provide Quality Control during the acquisition and processing of the data.

For the seismic acquisition programme, vessels shall be used that are constructed, equipped and operated in accordance with relevant requirements from the competent authorities in the country of registration and from a first class international classification bureau approved by IACS.

A Company Representative shall be onboard the survey vessel at all times for quality control. This does not, however, exempt Contractor from his responsibility of delivering all products to the specified acceptable standard / quality. In addition two fisheries representatives shall also be required to be onboard (the cost will be covered by Company). Company personnel shall if decided by Company be onboard during the acquisition.

### **3.3.1 Seismic Data Processing**

*[To be further detailed based on tender document and tender.]*

Algorithms and parameters used at each step in the processing sequence shall be subject to agreement with Company in writing prior to the production processing. Deviations from the basic sequence are also subject to agreement with Company.

The basic processing rate shall be based on the following estimated processing sequence:

- Reformat from SEG-D to contractor's own data format. Static shift correction for source/receiver depth. Bad shot and channel edits. Gain recovery
- Spherical divergence correction
- Merging the seismic traces to the navigation
- Resample to 4 ms
- Noise attenuation. The data will be searched for spikes, spurious high amplitudes and swell noise
- Deterministic signature de-convolution (zero phasing / minimum phasing) which shall be applied, using an operator designed to transform the modelled far field source signature to its zero phase equivalent. This process shall also take care of source and receiver ghost as well as the air gun bubble pulse
- Anti alias K-filter
- Linear noise attenuation in shot and receiver domain, focused on direct arrivals and refractions, contractor to specify methods
- SRME de-multiple
- SWD (Shallow Water De-multiple)
- Tau-p de-convolution in shot and receiver domain
- Diffracted multiple attenuation

- First pass velocity analysis every 2 km. All velocity picking shall be performed in agreement/cooperation with NPD staff. The data shall be muted (and properly pre-conditioned) prior to all velocity analyses
- FX de-convolution on common offsets
- Common offset linear noise-attenuation (FK filter), as appropriate
- Hi-Resolution Radon de-multiple with appropriate interpolation
- Second pass velocity analysis every 1 km. Input to pre-stack time migration (PSTM)
- Full 2D Kirchoff pre-stack time migration (PSTM)
- Third pass velocity analysis every 1 km x 1 km grid. Final velocities which have to be exported to EssoV2 and diskos98.1 format
- Second pass Hi-Resolution Radon De-multiple
- NMO correction. Pre-stack scaling, inner trace mute and outer trace mute. CDP stack
- Relevant post stack signal enhancement procedures
- Post stack scaling
- SEG-Y output

Optional extra processing (stipulated with individual rates):

- Wave Equation Multiple Attenuation

Processing parameters shall be tested on two or three parts from different lines and confirmed on two more lines before being applied in production. The test data should be available via FTP-server in SEG-Y format.

Seismic processing onboard the vessel shall be initiated and final processing shall be finished onshore. Contractor shall be responsible for all seismic processing.

### **3.4 Data Delivery and Final Products**

#### **3.4.1 General**

*[To be further detailed based on tender document and tender.]*

Raw 2D seismic data:

Contractor shall deliver raw 2D acquired seismic data on 3592 tapes as standard SEG-D. All navigation data shall be delivered on a suitable medium in standard UKOOA P1&P2 format.

All raw seismic data and all navigation data shall be delivered with no undue delay, and in any case no later than three weeks after survey completion, be shipped to Company's offices in Stavanger.

#### **3.4.2 Data delivery**

*[To be further detailed based on tender document and tender.]*

The following list of data shall be delivered to Company:

- Two copies of seismic field data on 3592 tapes in SEG-D format.
- Navigation data, UKOOA P2/94 and P1/90 on 3592 tapes.
- TOC files including tape-, acquisition- and FFID logs on CD-ROM.
- CMP map on CD-ROM and one paper copy.

<i>Item</i>	<i>Format</i>	<i>Media</i>
Final processing report	MS Word or PDF format	CD
Raw field data as received from client	SEG-D	3592
Final stacking & migration velocities	EssoV2 & diskos98.1	CD
Raw CDP gather before PSTM	SEG-Y	Hard disk
Raw common image gather (CIG) after PSTM	SEG-Y	Hard disk
Raw migration full-offset stack volume and sub stack volum (near,- mid- and far- angle)	SEG-Y	Hard disk
Final PSTM (TVS full offset volume)	SEG-Y	Hard disk

### 3.4.3 Reporting

[To be further detailed based on tender document and tender.]

The following reports shall be delivered to Company:

- Observers' Logs, Navigation Logs and Tape Logs on CD-ROM
- Onboard Seismic Processing QC and Calibration Report (delivered on completion of fieldwork) on CD-ROM
- Final acquisition reports on CD-ROM and two paper copies.

## 4 COSTS

### 4.1 General Conditions

[To be further detailed based on tender document and tender.]

Maximum contract value is set to NOK 70 million (incl. VAT for onshore data processing) for this project. The NPD may cover expenses that exceed this above defined financial framework – provided that this additional work is agreed upon in writing between the parties.

The following remuneration terms apply with respect to the rates set out in this Contract:

Except for in the specific instances as set forth in Articles 11.7, 11.8 and 12.2 of the General Conditions of Contract (hereafter: Additional Costs), the compensation, rates and fees shall be fixed and shall remain unchanged throughout the duration of the Contract.

The remuneration is comprised of the following categories:

- Mobilisation fee
- Demobilisation fee
- Production rate
- Standby rate
- Transit rate

- Seismic data processing costs
- Additional costs
- Early termination fee

#### **4.2 Production rate**

*[To be further detailed based on tender document and tender.]*

The following costs are included in the production rate:

- Costs for geophysical survey planning
- Costs for logistical survey planning
- All the specified processing (including post-processing of navigation data to UKOOA P1/90 format), end products and consumables (tapes etc)
- All conventional navigation costs, surface positioning and in-sea positioning
- Costs related to equipment performance and acceptance tests

#### **4.3 Standby rate**

*[To be further detailed based on tender document and tender.]*

Standby time is classified as time spent on:

- Waiting on weather
- Waiting due to seismic interference or other circumstances (e.g. fishing activity)
- Waiting due to marine conditions preventing or delaying the seismic operation to go-head, outside control of the contractor – also including time spent on port calls and other steaming on specific request by company.
- Waiting due to Force Majeure
- Non-operational periods due to instructions received from the Company to delay the Work

The breakdown of timing regarding production and standby shall, on a daily basis, be agreed between Contractor Representative and Company Representative onboard.

Downtime due to technical breakdown and Contractors Crew Change shall be covered by Contractor.

#### **4.4 Transit rate**

*[To be further detailed based on tender document and tender.]*

Transit rate is classified as steaming and transit to and from Survey Areas.

#### **4.5 Mobilization and Demobilization**

*[To be further detailed based on tender document and tender.]*

The Mobilization period shall be regarded as finished when the equivalent of one prime line in each survey direction has been successfully recorded, and all equipment work correctly as far as it can be reasonably demonstrated to the satisfaction of Company's Representative onboard. The production time shall then be counted from the first accepted shot point on the first accepted line.

#### **4.6 Seismic Data Processing**

*[To be further detailed based on tender document and tender.]*

#### **4.7 Additional costs**

*[To be further detailed based on tender document and tender.]*

Costs relating to optional Personnel in accordance with the GCC Article 5.2 and/or optional Equipment and services in accordance with the GCC Article 5.3 and/or optional logistics and infrastructure in accordance with any additional costs shall be agreed upon between the Parties in writing as they occur pursuant to Articles 11.7, 11.8 and 12.2 of the GCC.

#### **4.8 Early termination fee**

*[To be further detailed based on tender document and tender.]*

The Early termination fee shall cover all of the bidder's expenses in the event that the Company elects to exercise its right of early termination set out in the GCC Article 10.1. The Early termination fee shall comprise of a lump sum [not to exceed].

