DISKOS
NORWEGIAN PETROLEUM DATA

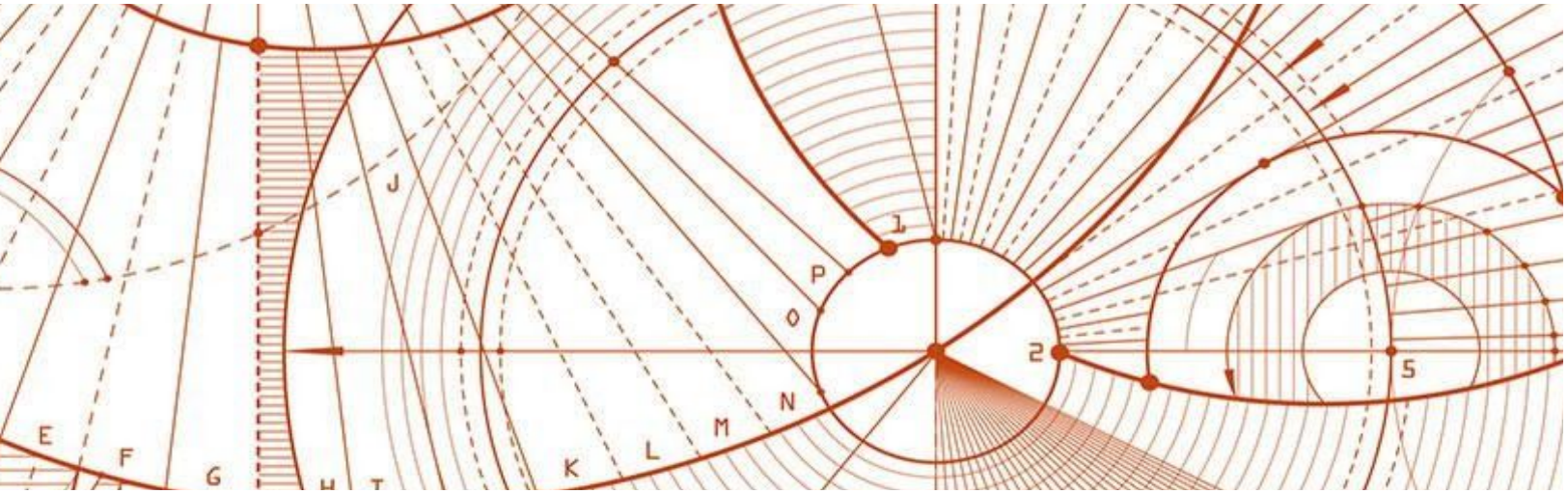
Diskos 2.0

Request for Proposal (RFP)

Trade module

Attachment 8A:

Guidelines for reporting geophysical data to authorities after completion (Yellow book)



30.12.2019

NPD

20. November 2019

Version 7.1

Guidelines for reporting geophysical data to authorities

(Yellow Book)

NORWEGIAN PETROLEUM DIRECTORATE

Version 7.1	November 2019	Added more examples in chapter 4.1.5 Naming of seismic datasets after reprocessing
Version 7.0	October 2019	Update regarding submission of 3592 10 TB tapes in chapter 5.1.2 Included in chapter 5.3 and in appendix G that the S-2 form is to be forwarded in PDF-format on one page only Updated text in chapter 5.3 specifying that exemption will also be valid for reprocessed or merged pre-stack datasets generated from the same survey. Modified the text in chapter 5.3 about exemption due to special patented processes. Modified text in chapter 5.3.2. Application is to be submitted after the survey has been completed. New chapters 5.3.3, 5.3.4. and 5.3.5 regarding far field signature Added text in chapters 5.4.2, 5.4.4, 5.5 and 5.6.1 to clarify use of coordinates in seismic trace data. Modified text in chapter 5.6.3.3 to clarify the difference between static merge and dynamic merge. Updated table S-1: 5.x.2.2 Field Data Far Field Signature defined for all survey types.
Version 6.0	September 2018	Modified text related to 4D surveys (chapter 5.3.2, 5.4.3 and 5.6.2) Updated text in chapter 5.8.1 "Data from site survey seismic" Table S-1 has been updated

Version 5.2	January 2018	Changed the references to match the sections in the latest revision of the Resource Regulation
Version 5.1	November 2017	No major changes in what has to be reported. However, more specific on what is mandatory metadata in the file headers (chapt 5.2.3) Some corrections and clarifications in the text to make it easier to understand, in particular which SEG-Y version to use. Included a section in chapter 5.3.2 about a limitation to report maximum 5000 m offset in 4D-field data
Version 5.0	September 2017	Some minor changes in terminology and text Changed from “Traditional marine surveys” into “Conventional marine surveys” in Chapter 4.1.1 Naming convention for 4D projects (new chapter 4.1.3.1) and 4D datasets (new chapter 4.1.7) Changes the content and structure of chapter 5. Included more information in chapter 5.2.1 about formats to be used for reporting seismic trace data. Modified classification of seismic datasets. New chapter 5.2.1 Included chapter 5.2.2 on verification of data Modified text in chapter 5.3 on application for exemption for reporting field data and prestack data for market available surveys

		New chapter 5.3.1 and 5.4.4 on reporting field data and prestack data from Site surveys New chapter 5.3.2 and 5.4.3 on reporting field data and prestack data from 4D surveys Added specifications regarding reporting of seismic inversion cubes in Chapter 5.6.1 Modified the requirements in chapter 5.6.2 for which 4D datasets to report New chapter 5.4.1 on Position – coordinate pre-stack data New chapter 5.5 Reporting of Geophysical 3D Regularized Data Revised Appendix A and B Updated example of 2D velocity data in Diskos V98 format in Appendix C Included a new Dataset in Table S-1 to cater for incapsulated files reported on DVD.
Version 4.1	October 2016	Corrected an error: Reprocessed projects and datsets shall be referred to the original survey name (Chapt 4.1.1 and 4.1.3)
Version 4.0	September 2016	Clarified which data is subject to new reporting regulations (2012) New section in chapter 2 about mandatory use of ED 50 and EPSG code More detailed explanations about “artificial surveys” and examples of both merged and reprocessed datasets in chapter 4.1 Correction of examples in chapter 4.1.5 New Chapter 5.1 Exchange format Some corrections to chapter 5.2 (old 5.1)

		Some clarification in chapter 5.2.1.3 and 5.2.4.1 Made more explicit that seismic data from Soil surveys shall not be reported Included the use of A, B, C to allow differentiation of more than one reprocessing in a calender year Made more clear which data is required from 4D-datasets (Chapter 5.2.1.6) Removed the first template in Appendix A Line 37-40 offset, 73-80 source XY, 181-188 CMP XY, 189-196 Inline Xline in the trace header are now made mandatory (Appendix A) Appendix F and G have got new names (before G and H) Changed code list for "Survey Kind" in Appendix F Slightly revised Table S-1 is published as a separate document/excel file
Version 3.1	October 2015	Included new section in chapter 5.2 for PRM data
Version 3.0	September 2015	Modified according to input from Yellow Book WG in Basecamp and meeting 20.8.2015. Main changes • Modified terminology list • Naming conventions for artificial surveys • New Appendix D – Minimum content of reports • Removed Appendix F – Naming of seismic data sets • Included comments regarding exemption from field data reporting

		for patented processes (sea surface ghost removal) • Included overview of what navigation is needed for storage of seismic data ref. chapter 5.1.4 • Included format for velocity data, ref. chapter 5.1.5 • Modified Table S1 (ref. Appendix E)
Version 2.0	September 2014	Published on NPD website 1 September • Included all input and corrections made to version 1.4 in Yellow Book WG meeting 16 June 2014
Version 1.4	December 2013	Published on NPD website 16 December 2013 • Included all input and corrections made to version 1.3 in Yellow Book WG meeting 4 December 2013
Version 1.3	Nov. 2013	Work in progress • Include some text on Grav/Mag reporting requirements Chapters 8 and 9 • Include naming convention for merged data sets • Include reporting of velocity models • Include most of the comments from work group after Elin's request of 15 March 2013. Remaining kept as "comments" for discussions • Naming conventions for seismic surveys moved from appendix to Chap. 4 • Lists of company codes included in Appendix F • First draft of requirements for EM data included in Chap. 7 • Version 1.3 was not published on NPD website

Version 1.2	4 December 2012	The naming convention for seismic datasets has been removed from Appendix E. Replaced version 1.1 on the NPD's website as per 4 December 2012
Version 1.1	30 November 2012	Modified after a meeting in the "Yellow Book Committee" in the NPD on 20 November 2012. Replaced version 1.0 on NPD's website as per 1 December 2012
Version 1.0	13 September 2012	Replaced the Beta version on the NPD website mid-September. The chapter headings have been changed, some texts are modified and Table S-1 is introduced
Beta Version	June 2012	First draft was put on the NPD website at the end of June.

Contents

0. Introduction

The purpose of this document is to define clear specifications for reporting of geophysical data to the Norwegian authorities. The current version provides consistent standards for reporting of seismic data and related information. Requirements for other data types will be included later, as they become available. The requirements shall be applicable for data and reports from surveys registered in NPD after 1. January 2012 and for data from reprocessing projects done after 1. January 2012.

1. Objective

The main objective of these Reporting Requirements from the Norwegian Petroleum Directorate (NPD) is to support the efficient exploitation of the country's hydrocarbon resources. The subject data will be kept confidential according to Section 85 of the Petroleum Regulations, and made available for use only by the NPD and authorised oil companies during the confidentiality period, and to other parties thereafter.

It is a basic requirement that all items are clearly identified, are of known quality and are maintained in a secure environment. Therefore, the reporting requirements are designed so that reported data is structured and identified in a common manner.

2. Reporting of Geophysical Data to the Authorities

Pursuant to Section 10-4 of the Petroleum Act, the Regulations to this Act Section 6, seventh and eighth subsections, Regulations relating to Resource Management in the Petroleum Activities (Resource Management Regulations) Section 25 and Article 12 in the relevant individual exploration license, the NPD instructs the licensees to report the following digital data, including the reports, directly to the Diskos Database Operator (DBO) to which the NPD has outsourced the data storage on behalf of the Authorities.

It is expected that most operational issues related to compliance with the regulatory requirements will be resolved by the data owner, or their contracted representative and the DBO. The data owner is responsible for any costs, including loading fees, according to the contract between the NPD and the DBO.

It is the data owners' responsibility to ensure that data is delivered within the required timeframes and that they are of appropriate quality and completeness. There will be no formal approval process involving the NPD. These Reporting Requirements can never provide an exhaustive list of all conceivable data types reported, but constitute a detailed framework within which any such data can be reported.

Data shall be delivered referenced to the geodetic datum ED50 unless otherwise agreed by NPD in each individual case. Metadata shall include the EPSG code and the parameters for the geodetic and projected Coordinate Reference System and the transformation.

The transformations from WGS84 to ED50 shall follow the IOGP guideline "Geodetic transformations offshore Norway (S&P 10)". The guideline can be obtained from IOGP bookstore at this URL: http://www.iogp.org/bookstore/ (Submit an order for report 373-10)

UTM zone information must be included when relevant.

3. Terminology

- **CDP** – Common depth point (or Common midpoint) - the common reflection point at depth on a reflector, or the halfway point when a wave travels from a source to a reflector to a receiver.
- **DBO - Diskos Database Operator** – The company to which the NPD has outsourced data storage on behalf of the authorities and the Diskos joint initiative.
- **Diskos NDR**– System for storage of geophysical data and other data types on behalf of the Diskos joint initiative and the NPD.
- **FFID** (or shot ID) – Field file ID
- **GIGS** (Geoscience integrity of geoscience software)
- **Merge dataset** – a dataset that contains data from more than one seismic survey
- **Near Common Depth Point** (nCDP) -The point halfway between the active source and any given near receiver group.
- **NMO** - Normal moveout
- **NPD** – Norwegian Petroleum Directorate
- **OBS** – Ocean Bottom Seismic
- **OBC** – Ocean Bottom Cable
- **OGP** - International Association of Oil & Gas Producers (OGP) Geomatics Committee
- **Processed Navigation data** – the dataset containing information on the location of the seismic traces, either as a separate file or imbedded in other seismic data.
- **PSDM** – Pre-Stack Depth Migration
- **Pseudo Near Common Depth Point**, Pseudo-NCDP (PnCDP) -A single-point view of a seismic sail line (3D). - PnCDP is a calculated midpoint between all receiver groups (for example all near receiver groups) and the sources.
- **PSTM** – Pre-Stack Time Migration
- **Raw Navigation data** – the dataset (usually in P2 format) containing observations of acquisition and used for the navigation processing at any time in the processing flow.
- **Reprocessed dataset** – a dataset that is the result of later processing (seismic project) than the first processed version distributed to the owner (and authorities). This can be done either by the owner of the input dataset(s) or by others that use public datasets or purchased datasets as input.
- **Seismic Dataset** – Collection of data that is the result of compiling or processing seismic data
- **Seismic field data**- the first non-processed data as a result of a seismic acquisition\\
- **Seismic post-stack data** – data that is the result of processing of prestack data
- **Seismic pre-stack data** – data that is the result of processing seismic field data from one seismic survey to a processing step prior to stacking
- **Seismic Project**- An activity of producing datasets from other existing datasets

- **Seismic survey**- the activity of seismic acquisition (seismic activity).
- **Shot point** - an event in which a number or a time reference is attached; i.e shot point number or shot point time. referenced with a numerical ID (Shot Point Number), X and Y according to CRS and time of firing with millisecond precision

4. Naming conventions

4.1. Naming conventions for seismic surveys and seismic datasets

The naming of the seismic surveys and datasets shall be unique. The NPDID for the survey shall always be part of the seismic surveys' and datasets' metadata.The following naming conventions must be used. Names of surveys already loaded to the system must not be changed.

4.1.1 Naming of seismic surveys

[Operator code][Acquisition year][Index indicating survey type]

Generic example: NN(N)YYXXX

NN(N)	Operator which the acquisition is done for
YY	Acquisition year
XXX	Index indicating survey type

Index ranges:

NNNYY000 -099	Conventional marine surveys
NNNYY100 -199	Soil surveys
NNNYY200 -249	OBS surveys
NNNYY300 -399	Site surveys

If the same operator acquires several surveys the same year, a different index within the relevant index range should make them unique (start from lower end).

For proper loading of datasets after **reprocessing**, a reprocessing project has to be established in Diskos to anchor the datasets. This project should be linked to the name and NPDID of the original acquisition survey.

For proper loading of datasets generated by **merging data from more than one survey**, an "artificial survey" has to be established in Diskos to anchor the project and the merged datasets. The names of these artificial surveys should be:

[Operator code][Merge production year][M][Index of merge per operator within merge production year]

Generic example: NN(N)YYMXX

NN(N)	Operator doing the merge
YY	Merge production year

M	Letter indicating that it is a merged “artificial survey”
XX	Index of merge per operator within merge production year

Example of naming convention for an ”artificial survey” (merges):

- ST12M01 (first merge done by Statoil in 2012)
- SH14M01 (first merge done by Shell in 2014)
- SH14M02 (second merge done by Shell in 2014)

4.1.2 Naming of seismic lines

The seismic line-name (dataset section) must always be unique and have the following format:

Survey name-line number
[Operator code][Acquisition year][Index indicating survey type]-[Line number]

Generic example: NN(N)YYXXX-ccccc

NN(N)	Operator
YY	Acquisition year
XXX	Index indicating survey type
ccccc	Line number

Example of naming convention for a seismic line:

- **NPD14001-01012** (survey NPD14001 and line number 01012)

4.1.3 Naming of seismic projects

Except for instructions regarding the first 7 or 8 first characters, (9-13 for reprocessing projects) the NPD does not require standard naming of seismic projects and datasets except that they must be unique for each dataset. Appendix E describes Diskos recommended standard filenames for seismic projects and datasets.

For proper loading of datasets after **reprocessing**, a new project has to be established in Diskos to anchor the datasets. The names of these projects should start with the following 9 - 13 characters:

[Operator code][Acquisition year] [Index indicating survey type][Operator code][R][Reprocessing year]

Generic example: NN(N)YYXX(X)LL(L)RZZ
NN(N) Operator which the acquisition is done for
YY Acquisition year

XX(X)	Index indicating survey type
LL(L)	Company reprocessing is done for (omit if same as acquisition operator)
R	Letter indicating that it is a reprocessed "artificial survey"
ZZ	Year of reprocessing

Example of naming convention for a "reprocessing project":

- SH0401R11 (2011 reprocessing by Shell of Shell 2004 acquisition)
- NH9401SHR14 (Reprocessing of public/purchased 1994 Hydro acquisition done by Shell in 2014)

Reporting to the authorities must also include relevant metadata such as processing type, etc. See appendix G.

For proper loading of datasets after **merging data from more than one acquisition survey**, a new project has to be established in Diskos to anchor the datasets. The names of these projects should start with the following 7-8 characters:

[Operator code][Merge production year][M][Index of merge per operator within merge production year]

Generic example: NN(N)YYMXX

NN(N)	Operator doing the merge
YY	Merge production year
M	Letter indicating that it is a merged project
XX	Index of merge per operator within merge production year

Example of naming convention for a "merged project":

- ST12M01 (first merge done by Statoil in 2012)
- SH14M01 (first merge done by Shell in 2014)
- SH14M02 (second merge done by Shell in 2014)

Reporting to the authorities must also include relevant metadata such as processing type, etc. See appendix G.

4.1.3.1 Naming of LOF, PRM and 4D seismic projects

Products from PRM, LOF and 4D processing (products from two or more surveys) should use following naming convention for seismic projects

LOF-FIELDNAME-xxx,
PRM- FIELDNAME-xxx
4D-FIELDNAME-xxx

to anchor datasets from different surveys to a common seismic projects.

Example	First	Second	Third	Forth (last)	
Survey	ST12201	ST13201 ST12201 (Base Survey)	ST14201 ST13201 ST12201	ST15201 ST14201 ST13201 ST12201	
Project	ST12201-xxx				
	LOF-FIELDNAME	LOF-FIELDNAME	LOF-FIELDNAME	LOF-FIELDNAME	Common project name for the whole life cycle
	LOF-FIELDNAME-2012	LOF-FIELDNAME-2013	LOF-FIELDNAME-2014	LOF-FIELDNAME-2015	New yearly project name

4.1.4 Naming of seismic datasets after first processing

[Survey name][Unique identifier]

Generic example: NN(N)YYXXXxxxxx

NN(N)	Operator which the acquisition is done for
YY	Acquisition year
XXX	Index indicating survey type
Xxxxx*….	Unique description of dataset

- For inversion datasets, the first xxx should read INV

See appendix G and the Diskos Media Delivery Form Guide

4.1.5 Naming of seismic datasets after reprocessing

[Operator code][Acquisition year][[Operator code][R][Reprocessing year][Unique identifier/more info on processing type etc]

Generic example: NN(N)YYXXXLL(L)RZZxxxxx

NN(N)	Operator which the acquisition is done for
YY	Acquisition year
XXX	Index indicating survey type
LL(L)	Company responsible for reprocessing (omit if same as Acquisition operator)
R	Letter indicating that it is a reprocessed dataset
ZZ	Year of reprocessing
Xxxxx*….	Unique description of dataset. If several reprocessings have been done by the same company the same year, the first x should be A for the second, B for the third etc. The rest is for the dataset owner to decide.

* For inversion datasets, the first xxx should read INV

Example of naming convention for seismic datasets after reprocessing:

- ST96001R05xxxxxx (reprocessing done by Statoil in 2005 of survey acquired by Statoil in 1996)
- BPN01001R12xxxxx (reprocessing done by BP in 2012 of survey acquired by BP Norge in 2001)
- BPN01001STR12xxxx (reprocessing done by Statoil in 2012 of survey acquired by BP Norge in 2001)

- BPN01001STR12Axxx (second reprocessing done by Statoil in 2012 of survey acquired by BP Norge in 2001)

When reprocessed datasets relates to surveys that do not follow the naming convention with operator prefix, the whole original survey name shall be included in the dataset name, i.e:

If reprocessed by the owner of the survey:
MC3D-XXX(X)YY(YY)R19xxxxxx

If reprocessed by another company:
MC3D-XXX(X)YY(YY)EQR19xxxxxx (Reprocessed by Equinor 2019)

See appendix G and the Diskos Media Delivery Form Guide

4.1.6 Naming of merged seismic datasets

[Operator code][Merge production year][M][Index of merge per operator within merge production year][Unique identifier/more info on processing type etc]

Generic example: NN(N)YYMXXxxxxx

NN(N)	Operator which the merge is done for
YY	Year when merge was done
M	Letter indicating that it is a merged "artificial survey"
XX	Index of merge per operator within merge production year
xxxxx….	Unique description of dataset

Example of naming convention for merged seismic datasets:

- ST12M01xxxxx (first merge by Statoil in 2012)
- BPN12M02xxxxx (second merge by BP Norway in 2012)

Meta data: The surveys composing the merge shall be documented in UKOOA- and SEG-Y headers and in metadata supplied to CGG on a predefined form, see Appendix G.

4.1.7 Naming of 4D seismic datasets

For datasets containing data that originates from several acquisitions, the dataset name shall include the first and last survey name from which data are included.

Example to anchor datasets from different surveys to a common seismic projects.

	First	Second	Third	Forth (last)	
Survey	ST12201	ST13201 ST12201 (Base Survey)	ST14201 ST13201 ST12201	ST15201 ST14201 ST13201 ST12201	
Project	ST12201-xxx LOF-FIELDNAME LOF-FIELDNAME-2012	LOF-FIELDNAME LOF-FIELDNAME-2013	LOF-FIELDNAME LOF-FIELDNAME-2014	LOF-FIELDNAME LOF-FIELDNAME-2015	Common project name for the whole life cycle New yearly project name
Dataset	ST12201-xxx	ST13201-xxx ST12201-xxx ST13201-ST12201-xxx	ST14201-xxx ST14201-ST13201-xxx ST14201-ST12201-xxx	ST15201-xxx ST14201-xxx ST13201-xxx ST12201-xxx ST15201-ST14201-xxx ST15201-ST13201-xxx ST15201-ST12201-xxx ST15201-ST14201-xxx ST15201-ST13201-xxx ST15201-ST12201-xxx	

4.2. Naming conventions for Grav/Mag surveys

The following naming conventions for gravity surveys must be used (when gravity measurements are not made along with a a seismic acquisition). This naming convention is to be applied to new surveys only. Surveys already loaded to the system must not be changed. Names and metadata of gravity datasets should reflect the survey name of the acquisition (either a seismic survey or a separate gravity survey). See also Appendix F and G.

[Operator code][Acquisition year][Index indicating survey type]

Generic example: NNYYXXX
NN(N) operator
YY acquisition year
XXX index indicating survey type

Index ranges:
NNNYY400 -499 Gravity surveys (and combined Grav/Mag surveys)
NNNYY500 -599 Magnetic surveys

If the same operator acquires several surveys the same year, a different index within the relevant index range should make them unique (start from lower end).

4.3. Naming conventions for electromagnetic (EM) surveys and electromagnetic datasets

The following naming convention for electromagnetic surveys and datasets must be used. This applies to new surveys only, surveys already loaded to the system must not be changed

[Operator code][Acquisition year][Index indicating survey type]

Generic example: NNYYXXX
NN(N) operator
YY acquisition year

XXX index indicating survey type

Index ranges:
NNNYY250 -299 EM surveys

If the same operator acquires several surveys the same year, a different index within the relevant index range should make them unique (start from lower end).

Naming Convention Example

Short convention for Shell in Norway is SH

- Acquisition data;
  - SH14250 (EM survey)

4.4. Naming conventions for acoustic surveys and acoustic datasets (sonar, etc.)

The following naming conventions for acoustic surveys and datasets must be used. This applies to new surveys only, surveys already loaded to the system must not be changed.

[Operator code][Acquisition year][Index indicating survey type]

Generic example: NNYYXXX
NN(N) operator
YY acquisition year
XXX index indicating survey type

Index ranges:
NNNYY600 -699 Acoustic surveys (Sonar etc)

If the same operator acquires several surveys the same year, a different index within the relevant index range should make them unique (start from lower end).

5. Reporting Requirements for seismic data

5.1. General about Exchange Format

5.1.1 Exchange Format Position/Coordinate Data

Since 1976 United Kingdom Offshore Operators Association (UKOOA) has issued exchange formats for seismic positioning data and raw navigation field data. IOGP (International Association of Oil & Gas Producers) has become custodian of several legacy UKOOA positioning and navigation data exchange formats, a.o. UKOOA P2/94, UKOOA P1/90 and UKOOA P6/98 .

In response to ever evolving acquisition and processing technologies, IOGP has developed new formats for exchange of geophysical position data, such as OGP P2/11, OGP P1/11 and

OGP P6/11. Both the legacy and new formats are named UKOOA/OGP Px/(94, 90, 98, 11), where x designates the data type, whether it is field navigation raw data (P2), navigation position data (P1) or 3D seismic bin grid data (P6).

It is a requirement that position data shall be submitted to DISKOS in one of the **OGP Px/11** formats. However, until further notice centre cell (seismic bin grid) data may still be reported in UKOOA P1/90 format.

The above rule and definitions are applicable for the entire document, hereafter the formats are only referred to as OGP P2, OGP P1 and OGP P6.

For further details on OGP formats please follow the URL:

http://www.iogp.org/geomatics/#geophysical-operations

5.1.2 Exchange Format Seismic Trace Data

Reporting of Field Data (SEG-D)	
Expected format for Field Data	SEG-D 3.1 (Little endian IEEE 9058)
Will accept format for Field Data after approval by the NPD	SEG-D 3.0 (IEEE) SEG-D 2.1
Expected Delivery media for Field Data	IBM 3592 Tape E07 4 TB or IBM 3592 Tape E08 10 TB
Reporting of Seismic Trace Data (SEG-Y)	
Expected format for Seismic Trace Data	SEG-Y rev 1*, IEEE, blocked traces if media is tape
Will accept format for Seismic Trace Data	SEG-Y rev 1 SEG-Y rev 0 with SEG-Y rev 1 trace header locations definitions
Expected Delivery media for Seismic Trace Data	IBM 3592 Tape E07 4 TB or IBM Tape E08 3592 10 TB USB 3 Portable disks FTP

***The goal is to make SEG-Y rev 2 (Little Endian, IEEE) the reporting standard pending discussion with Diskos Operator, Service Providers and Oil Companies to confirm compliance.**

Note concerning data reporting towards Diskos:
Loading efforts and SLA's are based on the ***Expected*** formats and media types mentioned above. Other formats and media may require additional data management effort and will therefore be subject to review.

The introduction of new formats and media types will be discussed with NPD prior to their use and updates to reporting standards will be made when appropriate to do so.

http://www.seg.org/resources/publications/misc/technical-standards

5.1.3 Documents and reports

Acquisition reports, Obs logs, Navigation Reports and Processing Reports shall be reported as separate pdf files according to Table S-1.

Reports must include the NPD survey ID, the survey name and a list of final deliverables. Formats shall be either PDF or ASCII, other proprietary formats will not be accepted, see also Table S-1.

The data owner is responsible for compliance with reporting requirements. Reports must be submitted as final versions, in English, and contain all necessary information such as report date, pagination, number of volumes and specification of enclosures (if any). Any revisions made to documents must be incorporated into a revised version of the report with a clear notation describing the revision number.

The DBO has the authority to return submitted reports that do not comply with requirements.

See also Appendix D - Reports and other documentation of seismic data – Diskos recommendations on the required content of these reports

5.2. General about data to be reported

5.2.1. Classification of data

With respect to reporting of seismic data to the Authorities, data should be classified in 4 categories:

- Field data
- Pre-stack data
- 3D Regularized data
- Post-stack data

The following table defines the classification of 3D Marine Seismic Data:

Dataset type	Classification	Seismic	Organizing	Navigation	Comments
Acquisition	Field data	SEG-D	Shot ordered	P2/11, P1/xx s/r	
NavSeis Merge	Pre-stack unregularized	SEG-Y	Shot ordered	P1/xx s/r	
3D Binning	Pre-stack regularized	SEG-Y	Shot ordered & Binned	P1/xx s/r, P1/xx Bin or P6/xx	Pre-stack 3D regularized Shot domain removed
Pre Stack migration (PSTM or PSDM)	Pre-stack regularized	SEG-Y	Binned	P1/xx Bin or P6/xx	Pre-stack 3D regularized Shot domain removed
Stack	Post-stack	SEG-Y	Binned	P1/xx Bin or P6/xx	

5.2.1.1. Classification of data in a processing and dataset context

The following table defines the classification of data in a simple seismic processing context. Reference to the S1 table is also incorporated with respect to datasets derived during this example process.

	Process	Seismic	Navigation	Velocity	Comments	S-1 ref.
Shot-ordered	Data from acquisition	SEG-D Shot-ordered	P2/11		Time, FFID/sp.#	5.1.2.1 / 5.1.5.1
	NavSeisMerge	SEG-Y Shot-ordered	P1/11 s/r		P1/11 nCDP and PnCDP	5.1.3.1 / 5.1.5.2 / 5.1.5.3
	Trace Edit					
	Deghost					
	Static Correction				Offset domain included	
	Noise Attenuation					
	Radon Velocities			Diskos V2	RMS-velocities	5.1.3.99
	Multiple Attenuation (including 2D SRME, 3D SRME, Radon +++)	SEG-Y Shot-ordered				5.1.3.2
Grid Regularized	3D Binning (inline/crossline reference included)	SEG-Y Shot-ordered and 3D regularized				5.1.3.2
	Match to other surveys (Merge)					5.1.3.2
	Migration Preparation					
	Pre Stack migration (PSTM or PSDM)	SEG-Y 3D regularized	P1/xx Bin or P6/xx		Shot domain removed	5.1.3.3 / 5.1.5.6
	Migration Velocities			SEG-Y or Diskos V2	Interval velocities/eta-values etc.	5.1.4.99

	(Back off migration velocities)					
	Stack Vel			SEG-Y	RMS-velocities	5.1.4.99
	PostMig Processing	SEG-Y 3D regularized			This data have been applied any Residual noise attenuation and residual multiple attenuation	5.1.3.3
Grid Stack	Stack	SEG-Y 3D bin	P1/xx Bin or P6/xx		Raw, Final, full, offset and/or angle stacks	51.4.1 / 5.1.4.2 / 5.1.4.3 / 5.1.5.6

5.2.2. Basic reporting requirements

Data, as well as reports, must include information about NPD survey ID(s) and the official survey name(s).

A list of deliverables shall accompany the reporting listing all data-sets and supporting documentation.

5.2.3. Verification of data

Verification of data is not covered in these guidelines.

It is expected that reporting of geophysical data to the Authorities shall contain meta-data which is sufficient to regenerate and/or re-engineer the processes data has been made subject to. Use of SEG-Y rev. 2 and OGP Px/11 formats facilitates options to make such regeneration and/or re-engineering an automated process. through machine inter-operability. It is a requirement that this option is utilized when data is reported using SEG-Y, rev.2 and OGP Px/11 formats. Full machine inter-operability is not yet a requirement for reporting geophysical data to the Authorities.

Adherence to the Authorities reporting requirements is the operators' sole responsibility.

The DBO has the authority to return submitted reports that do not comply with requirements.

5.3 Reporting of Geophysical Field Data

Reporting of all recorded trace data (raw field data) is mandatory. Reporting format is SEG-D. Licensees can apply to the NPD for exemptions from this requirement.

Reporting of Raw Navigation data is mandatory. Reporting format is OGP P2.

The following Reports, Logs, Documentation is mandatory to be reported together with geophysical field data.

Metadata according to all attributes as recorded on the NPD's FactPages (see Appendix E and F)
Acquisition reports, according to Table S-1
Navigation reports, according to Table S-1
Acquisition QC reports, according to Table S-1
Observer logs, according to Table S-1

Detailed information regarding content, valid formats, file names and how to organize the data transfer is provided in appropriate Chapters and Appendices of the Yellow Book.

General exemption from reporting field data

Companies can apply to the NPD for exemption from reporting field and pre-stack data from market available surveys when the survey acquisition is completed. In this application, all metadata as described in Appendix G (Table S-2) must be included as an enclosure in pdf-format zoomed into one page only. If exemption is granted, the exemption will also be valid for reprocessed or merged pre-stack datasets generated from the same survey.

Exemption from reporting standard SEG-D data for special patented processes

If the acquisition contractor is using a special patented process such as removal of receiver "ghost" and hence not making the SEG-D field data available to the oil company then an exception from reporting field data can be applied for. However in this case the oil companies must report the first available SEG-Y prestack dataset which must be in shot order. In this situation it is important to make sure Time Of Day is populated in the SEG-Y trace headers.

5.3.1 Reporting Site Survey Field Data

Geophysical field data from site surveys shall be reported in the same way as conventional seismic data. However, only data that is generated is mandatory to be reported, i.e datasets shall not generated only for the purpose of reporting. See chapter 5.8.1 It is the Operators responsibility to maintain the non-geophysical field data acquired in connection with a site survey. Non-geophysical field data from site surveys (e.g. samples, photos, video etc) shall not be reported according to these guidelines.

5.3.2 Reporting of Field Data from 4D surveys

Such datasets are also named 4D survey towed streamer, Seabed survey, Ocean Bottom Seismic (OBS), Ocean Bottom Nodes (OBN), Ocean Bottom Cable (OBC), Life Of Field Seismic (LOFS) or Permanent Reservoir Monitoring (PRM).

In general, field data from 4D-surveys must be reported. Field data from the first survey after 2012, and the last acquisition must always be reported. However, companies that have acquired 4D surveys or several 3D surveys covering the same area in between the first and last acquisition, can send an application to NPD for a dispensation from reporting field data. Such an application shall be accompanied by an overview of how new surveys relates to previous surveys.

There shall be only one application from each company each year, but several surveys can be included in this annual application when all the surveys have been completed. The NPDID should be included as well as metadata in form S-2 for each survey.

4D surveys acquired in connection with reservoir monitoring may exceed the lateral boundaries of the producing field. When reporting field data, it is allowed to crop the data to a lateral extent covering the area where reservoir changes has occurred since the last time a survey was acquired over the same area and at least 5.000 meters outside the said border.

Field data to be reported but can be offset limited to 5000 m or more and delivered as navigation seismic merge either in SEG-D or SEG-Y format.

However, if any of the intermediate acquisitions covers considerable wider area than the "first survey", the field data data from these surveys shall be reported.

Reporting requirements for 4D Field Data shall for the rest adhere to general reporting requirements for Geophysical Field Data.

5.3.3 Far Field signature document

Far field signature product(s) is mandatory to report as part of reporting seismic acquisition data.

Products to be include in far field signature document, digital representation of far field signature and near field hydrophone data

Far field signature report can be in a separate PDF file or as part of the Acquisition/Processing report.

Content should include:

Array configuration:
- Diagram to show the geometry of the source with all information needed for modelling, including:
  - gun volumes
  - gun type and setting
  - gun separations and depths
  - subarray separations
  - recording filter setting

Modelled far field signature without source ghost (full system recording filter applied):
- Figure of the far field signature time series (pdf)
- Figure of the far field signature amplitude spectrum (pdf)

Modelled far field signature with, source ghost and receiver ghost (full system recording filter applied):

- Figure of the far field signature time series (pdf)
- Figure of the far field signature amplitude spectrum signature (pdf)

Additional information:
- For all modeling, software and release number(s) to be specified. Instrument filter and full

system response need to be provided in SEG-Y and ASCII formats

- The full system response filter should be included the report

The report need to include information about near field hydrophone data including auxilitrace information and exitence of seperate products.

5.3.4 Far Field signature digital

Products to be include in far field signature digital reporting:

Modelled far field signature without source ghost (full system recording filter applied):
- Far field signature of array in ASCII and/or SEG-Y format (2 ms sampling)

Modelled far field signature with source ghost and receiver ghost (full system recording filter applied):

- Far field signature of array in ASCII and/or SEG-Y format (2 ms sampling)

- If the far field signature is recorded, indicate the auxiliary trace where this information is found.

5.3.5 Near Field Hydrophone data

If near field hydrophone data is available it can be reported as auxiliary traces within field data or as a separate dataset in SEG-D or SEG-Y format.

5.4 Reporting of Geophysical Pre-Stack Data (Un-regularized)

Reporting of nav-seis merged trace data is mandatory. Reporting format is SEG-Y.

Reporting of the following navigation data-sets for geophysical pre-stack data is mandatory. Reporting format is OGP P1.

- processed source/receiver navigation data (also named P1 s/r data)
- near trace CMP navigation data (also named P1 nCPD data)
- pseudo-nCMP navigation data (also named P1 PnCDP data)

P1 nCDP and P1 PnCDP data can be contained together with P1 s/r data, or being reported as separate files per CDP line for nCMP data and per boatline for pseudo-nCMP data..

If a separate Navigation Processing Report, Navigation Processing QC Report and/or Nav/Seis Merge Report are issued, it is mandatory to report this.

No additional data and information related to pre-stack data shall be reported.

Detailed information regarding valid formats, file names and how to organize the data transfer are provided in appropriate Chapters and Appendices of the Yellow Book.

Spec. companies can apply to the NPD for exemptions from this requirement.

5.4.1 Position – coordinate pre-stack data

Reporting of navigation data for the nav-seis merge seismic data is mandatory. Three types of coordinate data shall be reported:

- Source and receiver coordinates
- nCMP coordinates
- pseudo-nCMP coordinates

Headers shall be populated to secure an unambiguous and simple identification of the different data records.

Source and receiver-data, P1 s/r data, shall as minimum posses the following characteristics.

- OGP P1 format. Refer to Appendix B for more details
- Contain source and receiver coordinates for every shot-point seismic trace data is recorded.
- Contain coordinates for vessel(s), echo sounder(s), inactive source(s), tailbuoy(s), frontbuoy(s) and any additional GNSS antenna not already listed located on objects directly or indirectly towed by the seismic vessel(s) for every shot-point seismic trace data is recorded.
- It is a requirement that the OGP P1/11 potential with respect to full machine inter-operability as well as containing accuracy parameters, pre-plot information is utilized.

Near trace CMP data, P1 nCDP data, shall as minimum posses the following characteristics.

- OGP P1 format. Refer to Appendix QQQ for more details
- Contain nCMP coordinates for every source and near receiver-group combination for every shot-point seismic trace data is recorded.
- Contain unambiguous identification of each individual CMP line.
- P1 nCDP data can be contained in the source/receiver file, using record identifier “P1” and describing the nCMP by use of a combined position identifying source and streamer, e.g. “G2&S7” for the nCMP line involving gun 2 and streamer 7.

Pseudo-nCMP data, P1 PnCDP data, shall as minimum posses the following characteristics.

- OGP P1 format. Refer to Appendix B for more details
- Contain coordinates for the mid point between the main point of all near trace coordinates and the main point of the centre of all gun-arrays for every shot-point seismic trace data is recorded.
- When PnCDP data is reported in a separate file, the seismic line name shall equal the name of the line in the P1 s/r data-set.
- P1 PnCDP data can be contained in the source/receiver file, using record identifier “P1” and describing the Pseudo-nCMP by use of a combined position identifying source(s) and streamer(s), e.g. “G1&G2&S1&S2&S3&S4&S5&S6&S7&S8” when a 2 source and 8 streamer spread is used
- P1 PnCDP data will be used for indexing of seismic field data, pre-stack seismic data and small scale mapping.

See Appendix B for template concerning P1 s/r data, where P1 nCDP and P1 pseudo-nCDP data is included.

5.4.2 Seismic trace pre-stack data

Reporting of nav-seis merge trace data is mandatory. Data shall as a minimum possess the following characteristics.

- SEG-Y format, refer to Appendix A for more details
- Shot sorted (Shot Gathers)
- Textual File Header (EBCDIC header) to be populated with relevant information to comprehend the data-set. See Appendix A for template concerning Textual File Header.
- Binary File Header relevant to the SEG-Y file
- Extended Textual Headers and Data Trailers shall be included in the SEG-Y file and structured as User Data stanza to ensure machine operability and contain legal, administrative, acquisition, geodetic, spatial, geophysical information about the data-set.
- SEG-Y Trace Header locations shall be explained
- Reports and logs related to Nav-seis merge gathers data shall be reported according to Table S-1.

Textual File Header (EBCDIC) shall store the most important and relevant information to comprehend the data-set. The Extended Textual Headers and Data Trailers shall contain the information required to maintain full traceability of the geophysical data.

Reporting of de-multiple gathers in addition to nav-seis-merge gathers is optional. If reported, de-multiple gathers shall be reported in the shot-domain, uncorrected for velocities, as well as with no spherical divergence or gain applied.

It is mandatory to include final coordinates in SEGY trace headers and CRS information for the coordinates is to be defined in EBCDIC Header.

For non regularized data (shot data) source coordinates to be defined in byte location 73-76 (X) and 77-80 (Y). Group coordinates to be defined in byte location 81-84 (X) and 85-88 (Y).

5.4.2.1. SEG-Y Textual File Header (EBCDIC) requirement for Pre-stack data

The Textual File Header is the only SEG-Y header containing text for human comprehension only. As a minimum requirement Textual File Headers for Pre-stack data shall contain information about:

- Separate sections covering administrative, acquisition, geodetic, seismic and trace header information. The administrative information shall also include governmental provisions.
- Explicit information about number and content of Extended Textual File Headers and Data trailer stanza blocks (records).

For more detailed information it is referred to SEG-Y Textual File Header (EBCDIC header) template as well as Extended Textual Header and Data trailer stanza record templates for pre-stack trace data as shown in Appendix A.

Minimum governmental provision is to include NPDID in the Textual File Header.

5.4.2.2. SEG-Y Binary header requirement for Pre-stack data

It is a requirement that the following bytes in SEG-Y Binary header for Pre-stack data is populated with relevant information:

- Byte 3201 – 3204, Job ID number
- Byte 3205 – 3208, Line number
- Byte 3209 – 3212, Reel Number
- Byte 3213 – 3214, Number of data traces per ensemble
- Byte 3215 – 3216, Number of auxiliary traces per ensemble
- Byte 3217 – 3218, Sample interval
- Byte 3219 – 3220, Sample interval of original field recording
- Byte 3221 – 3222, Number of samples per data trace
- Byte 3223 – 3224, Number of samples per data trace for original field recording
- Byte 3225 – 3226, Data Sample Format Code
- Byte 3227 – 3228, Ensemble fold – the expected number of data traces per trace ensemble (e.g. the CMP fold)
- Byte 3229 – 3230, Trace sorting code
- Byte 3231 – 3232, Vertical sum code
- **Byte 3233 – 3248, Not relevant for marine un-regularized seismic data; bytes left with value 0 (zero)**
- Byte 3249 – 3251, Correlated data traces; 0 for nav.seis merge
- Byte 3251 – 3252, Binary gain recovered: 1 = yes 2 = no
- Byte 3253 – 3254, Amplitude recovery method shall be 1 (none)
- Byte 3255 – 3256, Measurement system
- Byte 3257 – 3258, Impulse signal polarity
- **Byte 3259 – 3296, Not relevant for marine un-regularized seismic data; bytes left with value 0 (zero)**
- Byte 3297 – 3300, The integer constant 16909060_{10} (01020304_{16}).
- **Byte 3301 – 3500, Unassigned**
- Byte 3501 , Major SEG-Y format revision number
- Byte 3502 , Minor SEG-Y format revision number
- Byte 3503 – 3504, Fixed Length Trace Flag
- Byte 3505 – 3506, Number of Extended Textual File Headers
- Byte 3507 – 3510, Maximum number of additional 240 byte trace headers
- Byte 3511 – 3512, Time basis code
- Byte 3513 – 3520, Number of traces in this file or stream
- Byte 3521 – 3528, Byte offset of first trace relative to start of file or stream if known, otherwise zero
- Byte 3529 – 3532, Number of 3200-byte data trailer stanza records following the last trace

5.4.2.3. Extended Textual File Headers and Data Trailer Stanza Records for Pre-Stack data

As a minimum requirement for Pre-Stack data Extended Textual Headers and Data Trailers shall contain information about:

- Acquisition parameters
- Geodetic parameters.
- Spatial parameters; description of lateral data extent

- Processing parameters
- Trace header mapping

With the exception of Trace header mapping it is required to use either User Data stanzas or User Data trailer stanzas to contain the required information. A combination of User Data stanza and User Data Trailer stanza is allowed. Provisions made in the format description for SEG-Y rev.2.X when to use User Data stanza or User Data Trailer stanza shall be adhered to. For Trace header mapping the SEG pre-defined stanza shall be used.

The Textual File Header contains human readable information about number of Extended Textual File Headers and the Binary File Header contains information about how this information is organized.

Each User Data stanza consists of a description block and a data block. The description block shall be a complete XML formatted explanation of the contents of the data-block. In order to ensure machine operability to the SEG-Y file the data block part shall contain encoded information; e.g. XML.

For nav.merge, pre-stack data-sets the aquisition, geodetic and spatial parameters as well as the lateral extent description are fully covered by incorporating the OGP P1 s/r file and the Observer Log, or document or file representing the contents of an Observer Log, as User Data Trailer stanza. Processing parameters shall be expressed in a separate User Data stanza in a computer readable format, e,g, XML format. Any trace edits performed to the data which are not already documented in Observer Log shall be documented explicit.

When de-multiple gathers is reported it is required to to document a full set of processing parameters by using User Data Trailer stanza.

It is optional to include other information, files or documents relevant to the trace data and/or the data-set, such as source geometry, copy of DMD form etc, by using Extended Textual File Headers.

Each User Data stanza contains information for one survey only. If the seismic project is a merge of two or more surveys, each contributing survey will have separate stanzas for acquisition, geodetic and spatial parameters as well as processing history description.

A re-processing of a survey does not need a new stanza for e.g. acquisition parameters and will normally maintain the geodetic parameters, but other stanzas will have to be modified. By utilizing separate User Data stanzas for each survey, it’s ensured that no information from the previous acquisition/processing is lost and that all necessary information is included in the SEG-Y file.

A detailed information about Extended Textual Header and Data trailer stanza records for pre-stack data is shown in Appendix A.

5.4.2.4. SEG-Y trace header requirements for Pre-stack data

In addition to the 240 byte Trace Header it is mandatory to include a 240 byte SEG-Y Trace Header Extension 1. It is expected that SEG standard is followed when Trace Header Information is populated.

If the data-set use Trace Header and/or Trace Header Extension 1 not strictly in accordance with SEG standard it is mandatory to include additional User Defined Trace Header Extensions to make a correct, complete and unambiguous Trace Header Mapping.

The file structure of a SEG-Y, rev.2 file can look like the following example:

Byte offset	Length (bytes)	Description
0	3200	Textual Header (ASCII)
3200	400	Binary Header
3600	3200	1st Extended Textual Header
6800	3200	2nd Extended Textual Header
10000	3200	3rd Extended Textual Header
13200	3200	4th Extended Textual Header
16400	3200	5th Extended Textual Header
19600	3200	6th Extended Textual Header
22800	3200	7th Extended Textual Header
26000	3200	8th Extended Textual Header
29200	240	1st Trace Header trace #1 (SEG00000)
29440	240	2nd Trace Header trace #1 (SEG00001)
29680	240	3rd Trace Header trace #1(GGF08511)
29920	12288	3072 Data Samples trace #1
42208	240	1st Trace Header trace #2 (SEG00000)
42448	240	2nd Trace Header trace #2 (SEG00001)
42688	240	3rd Trace Header trace #2(GGF08511)
42928	12288	3072 Data Samples trace #2
50227072	240	1st Trace Header trace #3860 (SEG00000)
50227312	240	2nd Trace Header trace #3860 (SEG00001)
50227552	240	3rd Trace Header trace #3860(GGF08511)
50227792	12288	3072 Data Samples trace #3860
50240080	3779200	User Data Trailer (Observer log and Navigation data)

The first 240-byte Standard Trace Header is named “SEG00000”, then the 240-byte SEG-Y Trace Header Extension 1 is named “SEG00001”, and then the 240-byte SEG-Y User Defined trace header extensions with user defined name, e.g. “GGF08511”.

When User Defined Trace Header Extensions is used it is mandatory also to include a User Header Stanza to make full explanation of the extension. In the example above a User Header Stanza explaining GGF08511 will have to be included.

5.4.3 Reporting prestack data from 4D-surveys

When reporting pre-stack data from 4D surveys, the same provisions are valid as as reporting field data for 4D surveys and applications for exemptions. (see chapter 5.3.2).

5.4.4 Reporting 2D and Site Survey Prestack Data

Reporting of the following navigation data-sets for geophysical 2D and Site Survey pre-stack data is mandatory. Reporting format is OGP P1.

- near trace CMP navigation data (also named P1 nCPD data)

Nav-seis merge trace data is generally not produced for 2D and Site Survey data and is therefore not mandatory to report.

It is mandatory to include final coordinates in SEGY trace headers and CRS information for the coordinates is to be defined in EBCDIC Header.

For regularized data (bin gathers) and post stack data, bin/cmp position is to be defined in byte location 181-184 (X) and 185-188 (Y).

5.5 Reporting of Geophysical 3D Regularized Data (Pre-stack)

De-multiple gathers is described in section "Reporting of Geophysical Pre-stack data. (Un-regularized)".

Until further notice is made by the Authorities, SEG-Y, rev.1 will be allowed when reporting 3D Regularized data. If SEG-Y, rev 2 is used as format for reporting, the requirements made for Pre-stack (un-regularized) will apply. If SEG-Y, rev 2 is used for reporting it is also required that navigation data is reported in OGP P1/11 or P6/11 format.

It is mandatory to include final coordinates in SEGY trace headers and CRS information for the coordinates is to be defined in EBCDIC Header.

For regularized data (bin gathers) and post stack data, bin/cmp position is to be defined in byte location 181-184 (X) and 185-188 (Y).

5.5.1 "PSTM / PSDM gathers"

If PSTM/PSDM gathers are part of the processing sequence it is mandatory to report at least one version. The reporting format is SEG-Y.

- For multi-component seismic, options exist for whether S-wave data are output in PS time or PP time and for whether data is split into azimuth sectors. The data owner should decide what is appropriate to report and must document this.

- Sorting: BIN sorted (Bin Gathers)
    - Inline – Crossline
    - Crossline should increase or decrease throughout each SEG-Y file.

- The most important SEG-Y trace header requirements (BIN Gathers)
    - Trace number within a line (byte pos 1)
    - No of samples (byte pos 115)
    - Sample Interval (byte pos 117)
    - Inline (byte pos 189)
    - Crossline (byte pos 193)

- SEG-Y trace header requirements (CDP Data – Sub Surface Lines)
  In addition to the mandatory trace header as shown in Appendix A, Chapter 1, the mandatory trace header information according to Appendix A, Chapter 2 should be filled in.

5.5.2 Post migration processed gathers

It is possible to report the post migration processed gathers, being the last step before the stack. The reason for this is that after the PSDM/PSTM, a more correct velocity is picked and applied to the data, making it possible to do a better job in removing remaining noise and multiples.

The post migration processed gathers is not a replacement of the PSDM/PSTM gathers for reporting to Diskos. It is optional to report the post migration processed gathers.

5.6 Reporting of Geophysical Post-Stack Data

5.6.1 Post-Stack Seismic Data from seismic surveys

The following datasets/versions (if created) are subject to mandatory reporting requirements for all data types (results of first processing and/or later reprocessing/merging):

- Raw stack after full pre-stack processing. This includes both full stacks and partial stacks (offset/angle).
- Final Stack after full pre-stack and post-stack processing. This includes both full stacks and partial stacks (offset/angle).
- All significant datasets
- "Fast track" products (FT processed sub-optimal early products)
- Seismic processing reports (also for FT, reprocessed data sets and merges)

Reporting format is SEG-Y. All datasets reported shall be accompanied by metadata in accordance with Appendix F and G. Until further notice is made by the Authorities, SEG-Y, rev.1 will be allowed when reporting Post-stack data. If SEG-Y, rev 2 is used for reporting, the requirements made for Pre-stack (un-regularized) will apply. If SEG-Y, rev 2 is used for reporting it is also required that navigation data is reported in OGP P1/11 or P6/11 format.

Reporting of all significant datasets is mandatory. A dataset is regarded as significant if it is shared with licence partners, if it is regarded by the company as a data set to be archived, or if the dataset has been used in a decision gate.

The requirements also cover re-processing and merges if distributed to partners or customers, etc. and as separate metadata when reporting to Diskos. 4D and merges must always refer to the NPD survey ID in the SEG-Y Textual File (EBCDIC) header and UKOOA header for all involved surveys contributing in the merge.

Raw stack and final stack should be reported in both time and depth if they have been created.

Loading of seismic inversion cubes is optional. The NPD shall, however, if loaded, be granted access to the loaded inversion cubes. The loaded inversion cubes will be handled as reported datasets and kept secret in line with other reported seismic datasets, ref section 85 in Regulation to Act relating to petroleum activities. Seismic inversion cubes, explicit requested by the NPD, shall be reported to Diskos.

Reports must include the NPD survey ID, the survey name and a list of final deliverables.

It is mandatory to include final coordinates in SEGY trace headers and CRS information for the coordinates is to be defined in EBCDIC Header.

For regularized data (bin gathers) and post stack data, bin/cmp position is to be defined in byte location 181-184 (X) and 185-188 (Y).

5.6.2 Reporting of 4D Post-stack data

All vintages and versions of post-stack data from 4D-surveys must be reported if these are shared with partners or if NPD asks for it.

5.6.3 Post-stack Navigation Data from conventional seismic surveys

The following description with respect to post-stack navigation data is also applicable to 3D regularized data.

Post-Stack CMP and BIN are navigation data produced in connection with a seismic processing project. In this context such data is regarded as the original post-stack navigation data and the requirements regarding correctness and integrity is high. Post-stack navigation data is intended to be merged with processed seismic data at a later stage. Navigation data for 2D, standard single 3D, reprocessed single 3D, merged 3D as well as 4D are covered.

The requirements are regarded as being valid in any situation where P1 formatted, post-stack navigation data is reported to the Authorities. Any processing deduced from the original data, which involves the creation of post-stack, navigation data shall adhere to the requirements. In this respect it is important to always preserve accountability (being able to trace the results back to the original data.) It is possible to use an unlimited number of P1/90, header comment records to store relevant information. The definition of "Relevant information" depends upon the type of data that is being reported.

Three different header templates are prepared. The header templates are stored in an Excel format. The first three fields (Excel columns), "Type", "Standard text" and "32" are fixed. "Type" is the record identifier, covering characters 1 to 5. "Standard text", covers characters 6 to 31, and is an explicit explanation of the content of the header record. "32" is a column in character position 32. These first three fields (covering character 1 to 32), should be copied directly into the P1 header.

"Variable text example" and "ID's", covering character positions 33 to 80, show a textual example. When a P1 file is created, character positions 33 to 80 shall be filled with appropriate variable text and ID's. A P1 record shall never exceed 80 characters. There is a separate field in the template, named "Mandatory" indicating whether the record is mandatory or not. The last Excel column, "Comment", is a comment field with an additional brief explanation of the record.

Records described under H0800 COORDINATE LOCATION shall be present under the data-record part of the file. If data-records only contain CDP coordinates, then only CDP coordinates should be described in the header (e.g. H0800 record). H0800 COORDINATE LOCATION descriptions of not present data-records should be avoided. The data records containing the coordinates shall correspond exactly with the specifications entered in the P1 header.

There is no restriction on how many H2600 Comment records that can be entered in a P1/90 header.

UKOOA Surveying and Positioning Committee issued in September 1999 an EPSG Coordinate System Description. This used UKOOA P-formats using a set of H80XX cards to improve machine readability of CRS information. Use of H80XX cards is not recommended

here, because the number of H08XX cards available is insufficient to always describe a post-stack P1 data-set. In circumstances where there are no pre-defined P1 header cards available an H2600 card should be used whenever there is essential information that should be stored.

In order to minimize the size of the post-stack BIN and CMP files, the number of data records can be decimated, as long as the first and last crossline is stored for every inline, thereafter every multiple of 50 crosslines can be written.

5.6.3.1 Post-stack 2D and CMP

It is important that coordinate types (locations) referred to in the header are actually present in the data records. It is particularly important that the coordinate type specified in the headers and record-identifiers used in data-records are consistent. E.g. if coordinate locations are CDP coordinates, then it should be clearly specified in the header positions' data-record identifier as "C". When coordinate locations are centre source, the data record identifier should be "S". It is possible to store more than just one type of data-record. The template is prepared for CDP, vessel and centre source positions to be stored.

The template is designed for a single source, single streamer 2D acquisition. When other source/streamer configurations are used, the header must be modified accordingly.

When important, valid information accompanies the data, the header comment-record H2600 shall be used.

5.6.3.2 Post-Stack BIN, Single Survey 3D Data

The template covers all types of single 3D navigation data, such as raw stack, raw mig, final mig as well as re-processed single 3D.

For bin grids, data-records shall contain the record-identifier "Q" only in which the grid is represented as discrete points.

In addition to the standard P1/90 header, shall grid-definition parameters be defined including grid origin, grid orientation, grid cell size in inline/crossline direction, grid interval, grid sample in addition to parameters for lateral extent of the grid. I.e. min/max rectangle, as well as a live data polygon of the grid with inline/cross line references and accompanying coordinates. This means the P1-header will also contain a geometrical representation, including extent of the grid. There are no predefined header-records to store such information in the P1/90 format, so an extensive use of H2600 header comment-records is needed to accommodate this.

When important, valid information accompanies the data, the header comment-record H2600 shall be used.

5.6.3.3 Post-Stack BIN, Merged 3D Data and 4D datasets

When data from more than one survey contributes to a grid, the grid will be a merged 3D data-set. In this case information from all contributing surveys should be present in the P1 header for the merged data-set.

Even though there is no fundamental difference, two types of 3D merged projects are defined:
• Static merge, final product(s) after processing
• Dynamic merge, "living" datasets with regular updates.

It is important that the different surveys contributing to a merge can be identified. As a minimum requirement the name and NPDID of each input survey must be clearly defined.

Also a demarcation polygon for each survey shall indicate which survey data has contributed to the merge. The demarcation polygons can overlap in the case when this is a description of how data from two (or more) surveys contribute to a merge. The demarcation polygons are technical descriptions of the contents of the merge.

It is expected that data-records containing the record-identifier "Q" are only stored in bin-grid data-sets, in which the grid is represented as discrete points.

In addition to the standard P1/xx header, shall grid-definition parameters be defined including grid origin, grid orientation, grid cell size in inline/crossline direction, grid interval, grid sample in addition to parameters for lateral extent of the grid. I.e. min/max rectangle, as well as a live data polygon of the grid with inline/cross line references and accompanying coordinates. This means the P1-header will also contain a geometrical representation, including extent of the grid. (Similar to the single post-stack 3D with a standard P1/xx header). There are no predefined header-records to store such information in the P1/xx format, so an extensive use of H2600 header comment-records is needed to accommodate this.

The P1 template for merged surveys shall also be used for 4D datasets. When important, valid information accompanies the data, the header comment-record H2600 should be used.

When two or more surveys are merged it is important to be aware of the fact that the input surveys don't necessarily share geodetic parameters; (geodetic datum, datum shift parameters and map projections). Extreme caution must be present in order to avoid lateral affinity in the data when data from different surveys is merged.

Appendix B contains the templates.

5.7 Velocity Data from conventional seismic surveys

The following datasets/version (if created) is subject to mandatory reporting:

- PSTM velocity products:
  - stacking velocities
  - migration velocities
  - interval velocities used for deriving angle stacks and gathers (if generated)
  - anisotropy parameters (if generated)

- PSDM velocity products:
  - stacking velocities
  - migration velocities (specify algorithm if appropriate)

- interval velocities used for deriving angle stacks and gathers (if generated)
- anisotropy parameters V0, delta, epsilon, dip cubes (if generated)
- velocity model for time-to-depth conversion

- Additional products for multi-component data:
  - Relevant S-wave velocity data should be reported.

- Format for delivery:
  - hand-picked velocities shall be reported in DiskosV98 format (see Appendix C)
  - final gridded models (after auto-picking or depth migration) shall be reported in SEG-Y. Data values must retain two decimal places: 1481.65 m/s (refer to Appendix A)
  - explicit definition of the SP-CDP relationship for 2D data is mandatory

- Format for velocity data:

Velocity Data

Velocity type	**Non regular**	**Regular**
Final stacking velocities	DiskosV98	SEG-Y
Time migration velocities	DiskosV98	SEG-Y
Depth migration velocities	DiskosV98	SEG-Y
Interval velocities		SEG-Y
Anisotropy Parameters		SEG-Y
Velocity Model		SEG-Y
S-Wave Velocity		SEG-Y
Other Velocity data	DiskosV98	SEG-Y

- Non regular velocities:
  "hand-picked" velocities where number of time/velocity pair can vary from location to location.

All volumes under velocity data shall be allocated an NPDID number for the seismic survey referenced in the velocity or SEG-Y tape header.

See also Appendix C - Formats for Seismic Velocity Data

5.8 Other types of seismic surveys

5.8.1 Data from site survey seismic

Geophysical data, navigation data and reports from site surveys shall be reported in the same way as conventional seismic data. However, only data that is generated and planned as final deliverables is mandatory to report.

In any case, the following data is mandatory:

- Shot receiver navigation data
- Raw seismic shot data, either as “field data” in SEGD or “navigation seismic merge” in SEGY
- Final post stack products formatted as SEGY with associated navigation data
- Relevant velocity data (ref chapter 5.7)
- Acquisition, processing and interpretation reports

If the report types listed in table S-1 are combined in one document, this will be copied and tagged in all dataset IDs relevant.

For reporting of site survey seismic, see also chapter 5.3.1 (Reporting Site Survey Field Data) and chapter 5.4.4 (Reporting 2D and Site Survey Prestack Data).

5.8.2 Data from soil survey seismic

Seismic data from soil surveys shall not be reported.

6. Reporting requirements for Grav/Mag surveys

The naming of separate Grav/Mag surveys shall be in accordance with Chapter 4.2.

Metadata for all Grav/Mag surveys must be reported. See Appendix F and G. If Grav/Mag data is acquired during a seismic survey, then this can be referred to in the seismic survey metadata.

Both raw data and processed data shall be reported. If a gridded dataset exists, this shall be reported in addition to the raw and processed data for each reading.

The file format shall be UKOOA P1/90, ASCII-format, the gridded dataset may be reported as an XYZ ASCII file

Grav/Mag data shall not be reported in the same data file as the seismic navigation.

7. Reporting requirements for electromagnetic surveys

Metadata on all EM-surveys shall be reported. This must include

Type of EM survey, e.g:

- Controlled-source electromagnetics (CSEM) Magnetotellurics (MT)
- Marine Onshore
- Ocean bottom node (OBN) Streamer

Types of datasets available, e.g.:

- Electric and magnetic fields
- Source current (CSEM)
- Navigation
- Environmental data
- Hardware description
- Calibration information
- Quality indicators (e.g. noise estimates)

The following data sets must be reported

- Field data (raw data or calibrated)
  - time series
- Processed data
  - Magnitude & phase data (frequency-domain CSEM)
  - Traces (transient CSEM)
  - Impedance tensor (MT)

The following reports are mandatory:

- Acquisition reports
- Processing reports

Reports are to be submitted digitally in an approved pdf format.

The location of the survey shall be reported as a polygon represented as a shape-file or 4 geographic georeferenced positions (cornerpoints).

The raw data and the processed data shall be submitted digitally in its existing format and will be loaded in Diskos as native files linked to the EM-survey

8. Reporting requirements for non-seismic acoustic surveys (sonar etc)

Reporting requirements will be specified later.

Appendix A –Seismic Data SEG-Y

For Pre-stack Un-regularized data it's recommended to follow the SEG-Y rev.2 Data Exchange standard (Ref SEG standards), but until further notice is made by the Authorities, SEG-Y, rev.1 will be allowed when reporting pre-stack un-regularized data
Other processed data, including Pre-stack Regularized data and Post-stack data, can be reported according to the SEG-Y rev1 standard (or higher).

To follow is an example of the SEG-Y Textual Header (including an example) in SEG-Y rev.2 format to be used when reporting Pre-stack un-regularized SEG-Y data. To follow is a description of the Textual Header (EBCDIC) using the "old" SEG-Y rev1 standard which is applicable to 3D regularized data and Post-stack data.

Description and Templates for 3D regularized and Post-stack data follows after the Pre-stack templates.

Textual File Header for Pre-Stack Un-regularized data (EBCDIC or ASCII)

As a minimum requirement Textual File Headers for Pre-stack data shall contain information about:

- Administrative, acquisition, geodetic, seismic processing and trace header information. The administrative information shall also include governmental provisions.
- Explicit number and content of Extended Textual File Headers and Data trailer stanzas.records.

If this is a merge of 2 or more surveys, the NPD surveyID for each survey shall be inside the SEG-Y Textual Header together with the survey name and project name for the merged survey. Detailed information of each of the surveys contributing to the merged survey shall be contained in Extended Textual File Headers and/or Data Trailer Stanza..

Example Pre Stack EBCDIC Header (3D), SEG-Y, rev.2

```
C01 CLIENT: OILCO     CONTRACTOR: PETTERSEN AS                        NPDID 8888
C02 LINE: OC17001-1021-1040S001      SHOTS: 1001-2699   PROJECT: OC17001, PL9999
C03 AREA: FINNMARK EAST BLOCK 7030/31, BARENTS SEA   PROCESSING DATE: 09-01-2017
C04 DATA TYPE: NAVIGATION-SEISMIC MERGE SHOT GATHERS
C05 ========================= ACQUISITION PARAMETERS ==========================
C06 VESSEL: PETTER OCEAN   SOURCE: 2 X SHAKER GUN ARRAY  VOL.: 3856 CU. IN.
C07 SOURCE DEPTH: 8.5M  WIDTH: 18M  LENGTH: 9M  SOURCE SEP: 50M  SHOT.INT.: 25M
C08 STREAMER: 10 X SLICKEEL   SEPARATION: 75M   DEPTH FRONT: 10M   TAIL: 30M
C09 STR.LENGTH: 8000M   GROUPS/STREAMER: 1280 (1ST=FRONT)  GROUP LENGTH: 6.25M
C10 RECORDING SYSTEM: BIGBROTHER  REC. LENGTH: 6100MS; SAMPLE INT.: 1MS;
C11 LC FILTER: 3HZ-18DB/OCT  HC FILTER: 125HZ-72DB/OCT  FORMAT: SEG-D REV3.1
C12 NAVIGATION SYSTEM: SPATIALFIX  POSITIONING: 4 X GNSS, 2 X RTK, 1 X ACOUSTICS
C13 ====================== GEODETIC AND SPATIAL PARAMETERS ====================
C14 GEODETIC DATUM: ED50      SPHEROID: INTERNATIONAL 1924      PROJECTION: UTM
C15 UTM ZONE: 36N       CENTRAL MERIDIAN: 033 DEG E      FALSE EASTING: 500000M
C16 PRIM LINE DIR 270 DEG  SEC LINE DIR 90 DEG  LINE NUMBERING ASC TOWARDS NORTH
C17 ========================== PROCESSING SEQUENCE ============================
C18 SEGD REFORMAT   NAV-SEIS MERGE-METHOD TIME   OUTPUT SEG-Y REV2.0
C19 STATIC CORRECTION NOT APPLIED
C20
C21
C22
C23
C24
C25
C26
C27
C28
C29
C30
C31
C32
C33 ====================== ADDITIONAL HEADER DESCRIPTIONS ======================
C34 1 EXTENDED TEXTUAL HEADER USING SEG DEFINED STANZA FOR TRACE HEADER MAPPING
C35 1 USER DATA TRAILER STANZA CONTAINING TWO BLOCKS:
C36 BLOCK 1: OBSERVER LOG, BLOCK 2:  OGP P1/11 S/R, NCDP, PNCDP DATA
C37 ============================= OTHER INFORMATION ============================
C38 POLARITY: AS RECORDED, AN INCREASE IN PRESSURE GIVES RISE TO POSITIVE NUMBER
C39 SEG-Y REV2.0
C40 END TEXTUAL HEADER
```

User Data Stanza

The formats of a user data stanza and a user data trailer stanza is the same.
Below is an example user trailer stanza with a full description block and the first three records of data blocks with P1 s/r data:

```
<segydescblock>
<version>1</version>
<blocksize>7026</blocksize>
<dataformat>text-p1/11</dataformat>
<datalabel>POSITIONDATA</datalabel>
<description>OC17001-1021_1040 source-receiver file</description>
<creationtime>2017-08-15 10:00:00Z</creationtime>
<creator>Geograf AS</creator>
<compression>none</compression>
</segydescblock>OGP,OGP P1,1,1.1,1,2017:05:31,20:29:07,OC17001-1021-1040S010.p111,
HC,0,1,0,Project Name                          ,OC17001 NPD8888,FINNMARK EAST BLOCK 7030/31 2017,2017:01:22,
HC,0,2,0,Survey Description                   ,Marine 3D Towed Streamer,1 VESSEL 2 SOURCE 10 STREAMER,BARENTS SEA,578,NOR
HC,0,3,0,Geographic Extent                    ,30.6,31.4,70.6,71.0
```

Textual File Header for Pre-Stack Regularized data and Post-Stack data (EBCDIC)

SEG-Y, rev.1 is NOT to be used for any pre-stack un-regularized data.

Until further notice is made by the Authorities, SEG-Y, rev.1 will be allowed when reporting 3D Regularized data. If SEG-Y, rev 2 is used as format for reporting, the requirements made for Pre-stack (un-regularized) will apply. If SEG-Y, rev 2 is used for reporting it is also required that navigation data is reported in OGP P1/11 or P6/11 format.

The textual file header should include the following information:

- Client = Name of survey operator
- Survey Name, Project name, Survey NPDID
- Area name
- Identification of processing contractor, place and time of processing
- Processing history as agreed with client and contractor
- SP/CDP relation for 2D data at a given point on the line or Byte position for inline/crossline information in trace header for 3D data
- Identification of survey and line by names. Line name should be complete including any prefix (f.ex. FF12001-0001)
- If this is a reprocessing add to prefix Ryy where yy is the year of reprocessing. .ex. FF11001R12-0001 we see that this survey was reprocessed in 2012).
- Identification of GEODETIC DATUM, PROJECTION, CENTRAL MERIDIAN and SPHEROID for coordinates in seismic.

For 2D data, the EBCDIC Header, should CLEARLY give the relationship CDP to shot-point numbering, at one tiepoint or as a formula.

For 3D data EBCDIC header should CLEARLY give byte position for inline/ crossline information in trace header.

For 3D data EBCDIC header should CLEARLY give coordinates of grid origin.

For 3D data EBCDIC header should CLEARLY give grid rotation in seconds related to grid North and clockwise in inline direction.

Example Post Stack EBCDIC Header (3D)

```
C01 CLIENT:NORWEGIAN PETROLEUM DIRECTORATE, PROCESSED BY PGS GEOPHYSICAL AS
C02 DATA: FAR OFFSET STACK, FORMAT: SEGY, DATE: JUNE 2009-DEC 2009
C03 SURVEY NAME: NPD14001         NPDID: 9999
C04 ACQUISITION:PGS, VESSEL: MV OCEAN EXPLORER,YEAR: 2014
C05 NO OF SOURCES: 2 TYPE: 3090 CU , DEPTH: 6M SP INT: 25M
C06 NO OF CABLES: 6 LENGTH: 6000M DEPTH: 9-10M GROUPS: 6X480 GROUP INT: 12.5M
C07 SOURCE SEPARATION: 50M CABLE SEPARATION: 100M
C08 INSTRUMENT: HTI NTRS2 system, REC MEDIA: 3592 REC FORMAT:SEG-D
C09 DATA TRACES/RECORD:2880 AUX TRACES/RECORD:48 SAMP INT: 2MS SAMP/TRACE: 4096
C10 RECORDING FILTER BANDPASS PGS LC:4.6 Hz, 6 dB/OCT HC: 206Hz, 276 dB/OCT
C11 PROCESSING:1) SEGD REFORMAT 2) SYSTEM DELAY 3) NAV. MERGE 4) DESIG. FILTER
C12 5) DC-AA FILT(1-3-100-120Hz) 6) RESAMPLE 4MS 7) SPHDIV CORR T**2
C13 8) SHOT/CHANNEL TRACE EDITS 9) K-FILT 10) SWELL NOISE ATTEN. 11) INTERPOL.
C14 12) AA K-FILT 13) TAU-P MUTE AND DECON SHOT/REC. 14) 2D SRME 15) 2D WAVE EQ.
C15 16) VEL. ANAL.(1x1KM) 17) HIGH RES. PARAB. RADON 18) SORT TO OFFSET CLASSES
C16 19) BINNING 20) INTERPOL. OF MISSING BINS 21) DENOISE 22) TVF 23) REGULAR.
C17 (25x12.5M) 24) ENS. BAL 25) SPHDIV REM. 26) MIG. VEL. SMOOTHING 27) PSTM MIG
C18 28) STK.VEL. ANAL.(500x500M) 29) ANGLEMUTE 30) STACK 31) GAIN 32) DECON
C19 33) LC-FILT 34) K-NOTCH 35) TR.INT. TO 12.5x12.5M 36) GUNREC STAT 37) SEGY
C20 BYTE POSITIONS IN SEGY HEADERS (ENTRY/BYTE POS/NO OF BYTES):INLINE 189 4;
C21 XLINE 193 4; COMPOSITE CDP 21 4; CDP-X 181 4; CDP-Y 185 4;
C22 SPHEROID: International 1924; DATUM: ED-50; PROJCTN: UTM,ZONE 32N,
C23 CENTRAL MERIDIAN 9 DEG E LAT ORIGIN 0 DEG N, FALSE EAST 500000M
C24 FALSE NORTH 0M, SCALE FACTOR 0.9996
C25 INLINE CELL SIZE: 12.5M INCR: 1 XLINE CELL SIZE: 12.5M INCR: 1
C26 INLINE DIRECTION (GRID): 22.3199 (CLOCKWISE FROM NORTH)
C27 CROSSLINE DIRECTION (GRID): 112.3200 (CLOCKWISE FROM NORTH)
C28 ORIGO (IL,XL);(1682,1202): UTM-X AT: 111111.11 M UTM-Y AT: 2222222.22 M
C29 GRID POLYGON(IL,XL): (1682,1202),(1682,7082),(3568,7082),(3568,1202)
C30 LIVE DATA CORNER COORDINATES:
C31 PT1: IL 2012   XL 2304     UTM-X 111111.11      UTM-Y 1111111.11
C32 PT2: IL 3240   XL 2010     UTM-X 222222.22      UTM-Y 2222222.22
C33 PT3: IL 3240   XL 6270     UTM-X 333333.33      UTM-Y 3333333.33
C34 PT4: IL 2008   XL 6286     UTM-X 444444.44      UTM-Y 4444444.44
C35 ON TAPE: FIRST - LAST IL  2008 - 2419 (1)  FIRST - LAST XL  2206 - 6286 (1)
C36 PROCESSING DATE        AUGUST - DECEMBER 2009, TAPE # 11111
C37 SURVEY LINE NAME       NPD14001-1001
C38 DATA TYPE CODE         FAR OFFSET STACK
C39 POLARITY: ZERO PHASED - A NEGATIVE SAMPLE CORRESPONDS TO AN INCREASE IN AI
C40 END EBCDIC
```

1. Binary Header

All bytes marked yellow are to be considered mandatory information. The LINE Number shall be in both the BINARY and the TRACE Header.

Table 1 - Binary File Header

400-byte Binary File Header	
Byte	**Description**
3201-3204	Job identification number.
3205-3208	Line number. For 3-D poststack data, this will typically contain the in-line number.
3209-3212	Reel number.
3213-3214[1]	Number of data traces per ensemble. Mandatory for prestack data.
3215-3216[1]	Number of auxiliary traces per ensemble. Mandatory for prestack data.
3217-3218[2]	Sample interval in microseconds (µs). Mandatory for all data types.
3219-3220	Sample interval in microseconds (µs) of original field recording.
3221-3222[2]	Number of samples per data trace. Mandatory for all types of data. Note: The sample interval and number of samples in the Binary File Header should be for the primary set of seismic data traces in the file.
3223-3224	Number of samples per data trace for original field recording.
3225-3226[3]	Data sample format code. Mandatory for all data. 1 = 4-byte IBM floating-point 2 = 4-byte, two's complement integer 3 = 2-byte, two's complement integer 4 = 4-byte fixed-point with gain (obsolete) 5 = 4-byte IEEE floating-point 6 = Not currently used 7 = Not currently used 8 = 1-byte, two's complement integer
3227-3228[3]	Ensemble fold — The expected number of data traces per trace ensemble (e.g. the CMP fold). Highly recommended for all types of data.

[1] This information is mandatory for pre-stack data.

[2] This information is mandatory for all data types.

[3] Strongly recommended that this information always be recorded

400-byte Binary File Header	
Byte	**Description**
3229-3230[3]	Trace sorting code (i.e. type of ensemble) : -1 = Other (should be explained in user Extended Textual File Header stanza 0 = Unknown 1 = As recorded (no sorting) 2 = CDP ensemble 3 = Single fold continuous profile 4 = Horizontally stacked 5 = Common source point 6 = Common receiver point 7 = Common offset point 8 = Common mid-point 9 = Common conversion point Highly recommended for all types of data.
3231-3232	Vertical sum code: 1 = no sum, 2 = two sum, …, N = M-1 sum (M = 2 to 32,767)
3233-3234	Sweep frequency at start (Hz).
3235-3236	Sweep frequency at end (Hz).
3237-3238	Sweep length (ms).
3239-3240	Sweep type code: 1 = linear 2 = parabolic 3 = exponential 4 = other
3241-3242	Trace number of sweep channel.
3243-3244	Sweep trace taper length in milliseconds at start if tapered (the taper starts at zero time and is effective for this length).
3245-3246	Sweep trace taper length in milliseconds at end (the ending taper starts at sweep length minus the taper length at end).
3247-3248	Taper type: 1 = linear 2 = $\cos^2$ 3 = other
3249-3250	Correlated data traces: 1 = no 2 = yes
3251-3252	Binary gain recovered: 1 = yes 2 = no
3253-3254	Amplitude recovery method: 1 = none 2 = spherical divergence 3 = AGC 4 = other

400-byte Binary File Header	
Byte	**Description**
3255-3256[3]	Measurement system: Highly recommended for all types of data. If Location Data stanzas are included in the file, this entry must agree with the Location Data stanza. If there is a disagreement, the last Location Data stanza is the controlling authority. 1 = Meters 2 = Feet
3257-3258	Impulse signal polarity 1 = Increase in pressure or upward geophone case movement gives negative number on tape. 2 = Increase in pressure or upward geophone case movement gives positive number on tape.
3259-3260	Vibratory polarity code: Seismic signal lags pilot signal by: 1 = 337.5° to 22.5° 2 = 22.5° to 67.5° 3 = 67.5° to 112.5° 4 = 112.5° to 157.5° 5 = 157.5° to 202.5° 6 = 202.5° to 247.5° 7 = 247.5° to 292.5° 8 = 292.5° to 337.5°
3261-3500	Unassigned
3501-3502[2]	SEG Y Format Revision Number. This is a 16-bit unsigned value with a Q-point between the first and second bytes. Thus for SEG Y Revision 1.0, as defined in this document, this will be recorded as 0100_{16}. This field is mandatory for all versions of SEG Y, although a value of zero indicates "traditional" SEG Y conforming to the 1975 standard.
3503-3504[2]	Fixed length trace flag. A value of one indicates that all traces in this SEG Y file are guaranteed to have the same sample interval and number of samples, as specified in Textual File Header bytes 3217-3218 and 3221-3222. A value of zero indicates that the length of the traces in the file may vary and the number of samples in bytes 115-116 of the Trace Header must be examined to determine the actual length of each trace. This field is mandatory for all versions of SEG Y, although a value of zero indicates "traditional" SEG Y conforming to the 1975 standard.
3505-3506[2]	Number of 3200-byte, Extended Textual File Header records following the Binary Header. A value of zero indicates there are no Extended Textual File Header records (i.e. this file has no Extended Textual File Header(s)). A value of -1 indicates that there are a variable number of Extended Textual File Header records and the end of the Extended Textual File Header is denoted by an ((SEG: EndText)) stanza in the final record. A positive value indicates that there are exactly that many Extended Textual File Header records. Note that, although the exact number of Extended Textual File Header records may be a useful piece of information, it will not always be known at the time the Binary Header is written and it is not mandatory that a positive value be recorded here. This field is mandatory for all versions of SEG Y, although a value of zero indicates "traditional" SEG Y conforming to the 1975 standard.
3507-3600	Unassigned

2. Trace Headers

All byte positions marked yellow are to be regarded as mandatory information and should always be filled in properly. Dead traces should have a Trace Header with TRACE TYPE = 2, and not be simply skipped. Duplicate Trace/Line numbers should be avoided. The CDP numbers must be in ascending order with an increment of 1. Gaps in the number sequence will be regarded as zero traces.

CDP number: Position: Trace identification header pos. 21-24.
SP number: Position: Trace identification header pos. 17-20.

The trace data values must be in an IBM 32-bit floating point format

Table 2 - Trace Header

240-byte Trace Header	
Byte	**Description**
1-4[3]	Trace sequence number within line — Numbers continue to increase if the same line continues across multiple SEG Y files. Highly recommended for all types of data.
5-8	Trace sequence number within SEG Y file — Each file starts with trace sequence one.
9-12[3]	Original field record number. Highly recommended for all types of data.
13-16[3]	Trace number within the original field record. Highly recommended for all types of data.
17-20	Energy source point number — Used when more than one record occurs at the same effective surface location. It is recommended that the new entry defined in Trace Header bytes 197-202 be used for shotpoint number.
21-24	Ensemble number (i.e. CDP, CMP, CRP, etc)
25-28	Trace number within the ensemble — Each ensemble starts with trace number one.
29-30[3]	Trace identification code: -1 = Other 0 = Unknown 1 = Seismic data 2 = Dead 3 = Dummy 4 = Time break 5 = Uphole 6 = Sweep 7 = Timing 8 = Waterbreak 9 = Near-field gun signature 10 = Far-field gun signature 11 = Seismic pressure sensor 12 = Multicomponent seismic sensor - Vertical component 13 = Multicomponent seismic sensor - Cross-line component 14 = Multicomponent seismic sensor - In-line component 15 = Rotated multicomponent seismic sensor - Vertical component 16 = Rotated multicomponent seismic sensor - Transverse component 17 = Rotated multicomponent seismic sensor - Radial component

[3] Strongly recommended that this information always be recorded.

240-byte Trace Header		
Byte	**Description**	
	18 = Vibrator reaction mass 19 = Vibrator baseplate 20 = Vibrator estimated ground force 21 = Vibrator reference 22 = Time-velocity pairs 23 … N = optional use, (maximum N = 32,767) Highly recommended for all types of data.	
31-32	Number of vertically summed traces yielding this trace. (1 is one trace, 2 is two summed traces, etc.)	
33-34	Number of horizontally stacked traces yielding this trace. (1 is one trace, 2 is two stacked traces, etc.)	
35-36	Data use: 1 = Production 2 = Test	
37-40	Distance from center of the source point to the center of the receiver group (negative if opposite to direction in which line is shot).	
41-44	Receiver group elevation (all elevations above the Vertical datum are positive and below are negative).	The scalar in Trace Header bytes 69-70 applies to these values. The units are feet or meters as specified in Binary File Header bytes 3255-3256). The Vertical Datum should be defined through a Location Data stanza (see section D-1).
45-48	Surface elevation at source.	
49-52	Source depth below surface (a positive number).	
53-56	Datum elevation at receiver group.	
57-60	Datum elevation at source.	
61-64	Water depth at source.	
65- 68	Water depth at group.	
69-70	Scalar to be applied to all elevations and depths specified in Trace Header bytes 41-68 to give the real value. Scalar = 1, +10, +100, +1000, or +10,000. If positive, scalar is used as a multiplier; if negative, scalar is used as a divisor.	
71-72	Scalar to be applied to all coordinates specified in Trace Header bytes 73-88 and to bytes Trace Header 181-188 to give the real value. Scalar = 1, +10, +100, +1000, or +10,000. If positive, scalar is used as a multiplier; if negative, scalar is used as divisor.	
73-76	Source coordinate - X.	The coordinate reference system should be identified through an extended header Location Data stanza (see section D-1). If the coordinate units are in seconds of arc, decimal degrees or DMS, the X values represent longitude and the Y values latitude. A positive value designates east of Greenwich Meridian or north of the equator and a negative value designates south or west.
77-80	Source coordinate - Y.	
81-84	Group coordinate - X.	
85-88	Group coordinate - Y.	
89-90	Coordinate units: 1 = Length (meters or feet) 2 = Seconds of arc 3 = Decimal degrees 4 = Degrees, minutes, seconds (DMS) Note: To encode ±DDDMMSS bytes 89-90 equal = $\pm DDD*10^4 + MM*10^2 + SS$ with bytes 71-72 set to 1; To encode ±DDDMMSS.ss bytes 89-90 equal = $\pm DDD*10^6 + MM*10^4 + SS*10^2$ with bytes 71-72 set to -100.	
91-92	Weathering velocity. (ft/s or m/s as specified in Binary File Header bytes 3255-3256)	
93-94	Subweathering velocity. (ft/s or m/s as specified in Binary File Header bytes 3255-3256)	
95-96	Uphole time at source in milliseconds.	

240-byte Trace Header		
Byte	**Description**	
97-98	Uphole time at group in milliseconds.	Time in milliseconds as scaled by the scalar specified in Trace Header bytes 215-216.
99-100	Source static correction in milliseconds.	
101-102	Group static correction in milliseconds.	
103-104	Total static applied in milliseconds. (Zero if no static has been applied,)	
105-106	Lag time A — Time in milliseconds between end of 240-byte trace identification header and time break. The value is positive if time break occurs after the end of header; negative if time break occurs before the end of header. Time break is defined as the initiation pulse that may be recorded on an auxiliary trace or as otherwise specified by the recording system.	
107-108	Lag Time B — Time in milliseconds between time break and the initiation time of the energy source. May be positive or negative.	
109-110	Delay recording time — Time in milliseconds between initiation time of energy source and the time when recording of data samples begins. In SEG Y rev 0 this entry was intended for deep-water work if data recording does not start at zero time. The entry can be negative to accommodate negative start times (i.e. data recorded before time zero, presumably as a result of static application to the data trace). If a non-zero value (negative or positive) is recorded in this entry, a comment to that effect should appear in the Textual File Header.	
111-112	Mute time — Start time in milliseconds.	
113-114	Mute time — End time in milliseconds.	
115-1163	Number of samples in this trace. Highly recommended for all types of data.	
117-1183	Sample interval in microseconds (μs) for this trace. The number of bytes in a trace record must be consistent with the number of samples written in the trace header. This is important for all recording media; but it is particularly crucial for the correct processing of SEG Y data in disk files. If the fixed length trace flag in bytes 3503-3504 of the Binary File Header is set, the sample interval and number of samples in every trace in the SEG Y file must be the same as the values recorded in the Binary File Header. If the fixed length trace flag is not set, the sample interval and number of samples may vary from trace to trace. Highly recommended for all types of data.	
119-120	Gain type of field instruments: 1 = fixed 2 = binary 3 = floating point 4 … N = optional use	
121-122	Instrument gain constant (dB).	
123-124	Instrument early or initial gain (dB).	
125-126	Correlated: 1 = no 2 = yes	
127-128	Sweep frequency at start (Hz).	
129-130	Sweep frequency at end (Hz).	
131-132	Sweep length in milliseconds.	

240-byte Trace Header	
Byte	**Description**
133-134	Sweep type: 1 = linear 2 = parabolic 3 = exponential 4 = other
135-136	Sweep trace taper length at start in milliseconds.
137-138	Sweep trace taper length at end in milliseconds.
139-140	Taper type: 1 = linear 2 = $\cos^2$ 3 = other
141-142	Alias filter frequency (Hz), if used.
143-144	Alias filter slope (dB/octave).
145-146	Notch filter frequency (Hz), if used.
147-148	Notch filter slope (dB/octave).
149-150	Low-cut frequency (Hz), if used.
151-152	High-cut frequency (Hz), if used.
153-154	Low-cut slope (dB/octave)
155-156	High-cut slope (dB/octave)
157-158	Year data recorded — The 1975 standard is unclear as to whether this should be recorded as a 2-digit or a 4-digit year and both have been used. For SEG Y revisions beyond rev 0, the year should be recorded as the complete 4-digit Gregorian calendar year (i.e. the year 2001 should be recorded as 2001_{10} ($7D1_{16}$)).
159-160	Day of year (Julian day for GMT and UTC time basis).
161-162	Hour of day (24 hour clock).
163-164	Minute of hour.
165-166	Second of minute.
167-168	Time basis code: 1 = Local 2 = GMT (Greenwich Mean Time) 3 = Other, should be explained in a user defined stanza in the Extended Textual File Header 4 = UTC (Coordinated Universal Time)
169-170	Trace weighting factor — Defined as 2^{-N} volts for the least significant bit. (N = 0, 1, …, 32767)
171-172	Geophone group number of roll switch position one.
173-174	Geophone group number of trace number one within original field record.
175-176	Geophone group number of last trace within original field record.
177-178	Gap size (total number of groups dropped).
179-180	Over travel associated with taper at beginning or end of line: 1 = down (or behind) 2 = up (or ahead)
181-184	X coordinate of ensemble (CDP) position of this trace (scalar in Trace Header bytes 71-72 applies). The coordinate reference system should be identified through an extended header Location Data stanza (see section D-1).
185-188	Y coordinate of ensemble (CDP) position of this trace (scalar in bytes Trace Header 71-72 applies). The coordinate reference system should be identified through an extended header Location Data stanza (see section D-1).

240-byte Trace Header	
Byte	**Description**
189-192	For 3-D poststack data, this field should be used for the in-line number. If one in-line per SEG Y file is being recorded, this value should be the same for all traces in the file and the same value will be recorded in bytes 3205-3208 of the Binary File Header.
193-196	For 3-D poststack data, this field should be used for the cross-line number. This will typically be the same value as the ensemble (CDP) number in Trace Header bytes 21-24, but this does not have to be the case.
197-200	Shotpoint number — This is probably only applicable to 2-D poststack data. Note that it is assumed that the shotpoint number refers to the source location nearest to the ensemble (CDP) location for a particular trace. If this is not the case, there should be a comment in the Textual File Header explaining what the shotpoint number actually refers to.
201-202	Scalar to be applied to the shotpoint number in Trace Header bytes 197-200 to give the real value. If positive, scalar is used as a multiplier; if negative as a divisor; if zero the shotpoint number is not scaled (i.e. it is an integer. A typical value will be -10, allowing shotpoint numbers with one decimal digit to the right of the decimal point).
203-204	Trace value measurement unit: -1 = Other (should be described in Data Sample Measurement Units Stanza) 0 = Unknown 1 = Pascal (Pa) 2 = Volts (v) 3 = Millivolts (mV) 4 = Amperes (A) 5 = Meters (m) 6 = Meters per second (m/s) 7 = Meters per second squared (m/s^2) 8 = Newton (N) 9 = Watt (W)
205-210	Transduction Constant — The multiplicative constant used to convert the Data Trace samples to the Transduction Units (specified in Trace Header bytes 211-212). The constant is encoded as a four-byte, two's complement integer (bytes 205-208) which is the mantissa and a two-byte, two's complement integer (bytes 209-210) which is the power of ten exponent (i.e. Bytes 205-208 * 10**Bytes 209-210).
211-212	Transduction Units — The unit of measurement of the Data Trace samples after they have been multiplied by the Transduction Constant specified in Trace Header bytes 205-210. -1 = Other (should be described in Data Sample Measurement Unit stanza, page 0 = Unknown 1 = Pascal (Pa) 2 = Volts (v) 3 = Millivolts (mV) 4 = Amperes (A) 5 = Meters (m) 6 = Meters per second (m/s) 7 = Meters per second squared (m/s^2) 8 = Newton (N) 9 = Watt (W)

240-byte Trace Header	
Byte	**Description**
213-214	Device/Trace Identifier — The unit number or id number of the device associated with the Data Trace (i.e. 4368 for vibrator serial number 4368 or 20316 for gun 16 on string 3 on vessel 2). This field allows traces to be associated across trace ensembles independently of the trace number (Trace Header bytes 25-28).
215-216	Scalar to be applied to times specified in Trace Header bytes 95-114 to give the true time value in milliseconds. Scalar = 1, +10, +100, +1000, or +10,000. If positive, scalar is used as a multiplier; if negative, scalar is used as divisor. A value of zero is assumed to be a scalar value of 1.
217-218	Source Type/Orientation — Defines the type and the orientation of the energy source. The terms vertical, cross-line and in-line refer to the three axes of an orthogonal coordinate system. The absolute azimuthal orientation of the coordinate system axes can be defined in the Bin Grid Definition Stanza. -1 to -n = Other (should be described in Source Type/Orientation stanza) 0 = Unknown 1 = Vibratory - Vertical orientation 2 = Vibratory - Cross-line orientation 3 = Vibratory - In-line orientation 4 = Impulsive - Vertical orientation 5 = Impulsive - Cross-line orientation 6 = Impulsive - In-line orientation 7 = Distributed Impulsive - Vertical orientation 8 = Distributed Impulsive - Cross-line orientation 9 = Distributed Impulsive - In-line orientation
219-224	Source Energy Direction with respect to the source orientation — The positive orientation direction is defined in Bytes 217-218 of the Trace Header. The energy direction is encoded in tenths of degrees (i.e. 347.8º is encoded as 3478).
225-230	Source Measurement — Describes the source effort used to generate the trace. The measurement can be simple, qualitative measurements such as the total weight of explosive used or the peak air gun pressure or the number of vibrators times the sweep duration. Although these simple measurements are acceptable, it is preferable to use true measurement units of energy or work. The constant is encoded as a four-byte, two's complement integer (bytes 225-228) which is the mantissa and a two-byte, two's complement integer (bytes 209-230) which is the power of ten exponent (i.e. Bytes 225-228 * 10**Bytes 229-230).
231-232	Source Measurement Unit — The unit used for the Source Measurement, Trace header bytes 225-230. -1 = Other (should be described in Source Measurement Unit stanza) 0 = Unknown 1 = Joule (J) 2 = Kilowatt (kW) 3 = Pascal (Pa) 4 = Bar (Bar) 4 = Bar-meter (Bar-m) 5 = Newton (N) 6 = Kilograms (kg)
233-240	Unassigned — For optional information.

Appendix B – Seismic Navigation Data in OGP P1 format

Navigation P1 source and receiver data.

Seismic navigation source/receiver (pre-stack un-regularized) data shall be in OGP P1/11 format.

To follow is an example of a P1 s/r file in OGP P1/11 format.
The example is readable by use of any application that knows the OGP P1/11 format, but the header is not complete.

Please note the presence of NPD survey ID in the header. In addition it is demonstrated how nCDP and PnCDP coordinates are defined and stored in the P1 s/r file.:

```
OGP,OGP P1,1,1.1,1,2017:05:31,20:29:07,OC17001-1021-1040S010.p111,
HC,0,1,0,Project Name                          ,OC17001 NPD8888,FINNMARK EAST BLOCK 7030/31 2017,2017:01:22,
CC,1,0,0,Please note mandatory specification of NPDID for the survey
HC,0,2,0,Survey Description                    ,Marine 3D Towed Streamer,1 VESSEL 2 SOURCE 10 STREAMER,BARENTS SEA,578,NOR
HC,0,3,0,Geographic Extent                     ,30.6,31.4,70.6,71.0
HC,0,4,0,Client                                ,OilCo
HC,0,5,0,Geophysical Contractor                ,Pettersen
HC,0,6,0,Positioning                           ,.........
CC,1,0,0,....
CC,1,0,0,....
HC,1,9,0,Example Point Conversion              , 1,Satellite to Survey Test Point, 1,3.88022833, -3.63188056,, 2,3.88022833,-3.63188056,,3,429846.20,428914.57,
HC,2,0,0,Survey Configuration                  , 2,1,97,1,metre
HC,2,1,0,SpatialFix                            , 1,P111 Finalizer         , SpatialFix, 1.99.9,2017:01:01
HC,2,1,0,EelRec                                , 2,SEGD 3.1 9058 Recording, EelRec    , 1.99.9,2017:01:01
HC,2,1,1,Fixrate ......
CC,1,0,0,....
CC,1,0,0,....
HC,2,2,0,Seismic Recorder                      ,   1,RX01, RxEelRec , Arctic type
CC,1,0,0,....
CC,1,0,0,....
CC,1,0,0,Object reference numbers in this P1 file are according to the following scheme
CC,1,0,0,Streamers use 200 series for object reference number
CC,1,0,0,Gun arrays use 300 series for object reference number
CC,1,0,0,Buoys use 400 series for object reference number
CC,1,0,0,Common Mid Points use 500 series for object reference number
HC,2,3,0,VESSEL Petter Ocean                   ,  10,V1    , 1, Ref Point Vessel   ,      , 1,  9,   0.000,    0.000,  0.000,,32,0, 0
HC,2,3,0,SOURCE G1 towed by V1                 , 301,G1    , 4, Centre Gun Array   ,Shaker, 5, 10,  25.000, -880.000, -7.000,,18,0, 0
CC,1,0,0,....
CC,1,0,0,....
HC,2,3,0,STREAMER S01 towed by V1              , 201,S01   , 2, Ref Point Str 1    ,CFG   , 9, 10, 450.000,-1030.000,-15.000,, 4,0, 0
CC,1,0,0,....
CC,1,0,0,....
HC,2,3,0,FRONTBUOY FB1 towed by V1             , 411,FB1   ,10, Ref Point FB1      ,      , 2, 10, 460.000, -999.000, 15.000,, 0,0, 0
HC,2,3,0,TAILBUOY TB1 towed by S01             , 401,TB1   ,10, Ref Point TB1      ,      , 2,201,   0.000,-8497.252, 15.000,, 0,0, 0
CC,1,0,0,....
CC,1,0,0,....
HC,2,3,0,Central point G1 & G2                 , 350,G1&G2 ,12, Mid Pnt gun arrays ,     ,,301&302,  0.000, -880.000, -7.000,, 1,0, 0
HC,2,3,0,Central point S01 to S10              , 299,Sx    ,12, Mid Pnt streamers  ,     ,,201&202&203&204&205&206&207&208&209&210, 0.000,-1030.000,-15.000,, 1,0, 0
HC,2,3,0,PnCDP                                 , 500,PnCDP ,12, Mid Pnt G1G2 and Sx,CMP  ,,350&299,  0.000, -955.000,-11.000,, 0,0, 0
HC,2,3,0,nCDP G1 to S01                        , 501,nCDP11,12, Mid Pnt G1 and S01 ,CMP  ,,301&201,237.500, -955.000,-11.000,, 0,0, 0
HC,2,3,0,nCDP G1 to S02                        , 502,nCDP12,12, Mid Pnt G1 and S02 ,CMP  ,,301&202,177.500, -955.000,-11.000,, 0,0, 0
CC,1,0,0,....
CC,1,0,0,....
HC,2,3,0,GPS V1G1 on V1                        ,1040,V1G1  , 3, Node V1G1          ,GPS   ,  , 10,   1.120,    0.150, 37.010,, 0,0, 0
HC,2,3,0,GPS FB1G1 on F1                       ,1060,F1G1  , 3, Node F1G1          ,GPS   ,  ,411,   0.000,    1.150,  2.010,, 0,0, 0
CC,1,0,0,....
CC,1,0,0,....
H1,0,0,0,File Contents Description          , Final s/r nCDP and PnCDP Positions, Computed by SpatialFix
H1,0,1,0,Processing Details                 ,
H1,0,2,0,Receiver Groups Per Shot           , 1,  9072,,
H1,0,2,0,Sequence(s) in P1/11 file          , 8,    10,,
H1,1,0,0,Position Record Type Definition    , 1,     6, 2, 1, 1, 2, 0,
H1,1,0,1,Position Record Quality Definition , 1,95.000, Vessel ref pnt Absolute Error Ellipses, 1, 3, 0,
H1,1,0,0,Position Record Type Definition    , 2,     6, 2, 1, 1, 2, 0,
H1,1,0,1,Position Record Quality Definition , 2,95.000, Gun string Absolute Error Ellipses    , 1, 3, 0,
CC,1,0,0,....
CC,1,0,0,....
H1,2,0,0,Receiver Record Type Definition         , 1, 648,7, 2, 1, 1, 2, 2, 0,
H1,2,0,1,Receiver Record Quality Definition , 1,95.000, Rx group Absolute Error Elipses       , 1, 3, 0,
H1,2,2,0,Receiver Group Definition          , 1,201,   1,0.000,    0.000,0.000,  12,0.000,  -62.768,0.000,6,12.554,8395
H1,2,2,0,Receiver Group Definition          , 1,201,  13,0.000,  -75.561,0.000,  24,0.000, -138.326,0.000,6,12.553,8395
H1,2,2,0,Receiver Group Definition ...
CC,1,0,0,....
CC,1,0,0,....
H1,4,0,0,Preplot Record Type Definition     , 1, 500, 0, 3, 3D Survey, 1, 2, 3, 1,  ,  , 0,
H1,4,0,1,CMP spacing                        , 1, 1, 25.0, 1, Metre
CC,1,0,0,....
CC,1,0,0,....
N1,0,1,1,Line OC17001-1021-1040             , 1043, 2513
CC,1,0,0,....
CC,1,0,0,....
CC,1,0,0,Parts of the first set of data records including pre-plot to follow
N1,1,1,1,                        1043                                        ,429479.433,388191.674, 0.000,3.51183117,-3.63492189,,
P1,0,OC17001-1021-1040S010,,1043,1043,1,2017:01:15:04:25:54.769831,  10,    V1,4, ,429479.433,388191.674, 0.000,3.51183117,-3.63492189,,3.51183117,-3.63492189,,0.87,0.87,46.25,,,
S1,0,OC17001-1021-1040S010,,1043,1043,1,2017:01:15:04:25:54.769831, 301,    G1,4, ,429457.180,387311.034,-7.222,3.50386440,-3.63511686,,3.50386440,-3.63511686,,1.17,1.04,59.40,,,
P1,0,OC17001-1021-1040S010,,1043,1043,1,2017:01:15:04:25:54.769831, 301,    G1,4, ,429457.180,387311.034,-7.222,3.50386440,-3.63511686,,3.50386440,-3.63511686,,1.17,1.04,59.40,,,
P1,0,OC17001-1021-1040S010,,1043,1043,1,2017:01:15:04:25:54.769831, 311, G1S1,1, ,429465.190,387310.528,-7.100,3.50385987,-3.63504474,,3.50385987,-3.63504474,,1.25,1.09,44.81,,,
CC,1,0,0,....
CC,1,0,0,....
P1,0,OC17001-1021-1040S010,,1043,1043,1,2017:01:15:04:25:54.769831, 201,   S01,1, ,430201.893,387152.676,-5.006,3.50243637,-3.62841131,,3.50243637,-3.62841131,,1.15,1.05,70.92,,,
CC,1,0,0,....
CC,1,0,0,....
P1,0,OC17001-1021-1040S010,,1043,1043,1,2017:01:15:04:25:54.769831, 401,   TB1,1, ,430380.842,378652.513, 0.000,3.42554126,-3.62674967,,3.42554126,-3.62674967,,1.34,1.17,50.90,,,
CC,1,0,0,....
CC,1,0,0,....
P1,0,OC17001-1021-1040S010,,1043,1043,1,2017:01:15:04:25:54.769831, 500, PnCDP,1, ,430380.842,378652.513, 0.000,3.42554126,-3.62674967,,3.42554126,-3.62674967,,1.34,1.17,50.90,,,
P1,0,OC17001-1021-1040S010,,1043,1043,1,2017:01:15:04:25:54.769831, 501,nCDP11,1, ,430380.842,378652.513, 0.000,3.42554126,-3.62674967,,3.42554126,-3.62674967,,1.34,1.17,50.90,,,
CC,1,0,0,....
CC,1,0,0,....
R1,1,OC17001-1021-1040S010,,1043,1043,1,2017:01:15:04:25:54.769831, 201,   S01,1,1,430201.893,387152.676, 5.006,3.50243637,-3.62841131,,3.50243637,-3.62841131,,1.15,1.05,70.92,
```

Regularized pre-stack and post-stack data

The following templates are not for un-regularized pre-stack data.

It is allowed to report 3D regularized and Psot-stack data using the P1/90 format.

The templates are prepared for three theoretical NPD surveys. Survey names and locations are prepared with no link to real data whatsoever, and should purely act as explicit examples of how to prepare P1/90 headers.

OD0605: Theoretical 2D survey acquired by NPD in 2006
OD0705: Theoretical 3D survey acquired by NPD in 2007
OD11005: Theoretical 3D survey acquired by NPD in 2011
OD11005MZ11: Theoretical merge processed 2011 using OD11005 as main survey.

P1 format description can be obtained from IOGP bookstore at this URL:
http://www.iogp.org/bookstore/
(Submit an order for report SKU 483-1)

Geodetic parameters and EPSG codes can be obtained from this URL:
http://www.epsg-registry.org/

GIGS User guide with the companion test data sets can be obtained from IOGP bookstore at this URL:
http://www.iogp.org/bookstore/
(Submit an order for report SKU 430-3)

Sometimes a re-processing of a data-set will make use of some data from adjacent surveys. The information from adjacent surveys shall be part of the P1 header to be created.

To follow are three OGP P1 templates prepared for use of the P1/90 format:

- 2D single survey
- 3D single survey
- 3D merged survey (applicable also to 4D time lapse survey)

And one OGP P1 template prepared for use of the P1/11 format:

- 3D single survey (source/receiver)

Template - 2D single survey

Type	Standard text	32	Variable text example	ID's	Mandatory	Comment
H0100	SURVEY AREA	:	Norway, Finnmark East, Block 7030/7031		Yes	
H0101	SURVEY DETAILS	:	2D Seismic Survey - OD0605		Yes	
H0102	VESSEL DETAILS	:	MV Petter Ocean	1	Yes	Name and ID of vessel
H0103	SOURCE DETAILS	:	Bolt, Sleeve Gun	1 1	Yes	Name and ID of source
H0104	STREAMER DETAILS	:	Sercel, streamer 1, 360 channels	1 1	Yes	Name and ID of streamer
H0200	DATE OF SURVEY	:	05/06 - 06/06		Yes	Start/end month of survey
H0200	DATE OF PROCESSING	:	08/06 - 10/06		Yes	Start/end month of seismic processing
H0201	DATE OF TAPE	:	05/10/06		Yes	Date when data could be exchanged
H0202	TAPE VERSION ID	:	UKOOA P1/90, Dataset OD0605T11A		Yes	Name of dataset to be exchanged
H0203	LINE PREFIX	:	OD0605			To be used when line-name exceeds 12 characters
H0300	CLIENT NAME	:	NPD		Yes	
H0400	GEOPHYSICAL CONTRACTOR	:	Pettersen AS		Yes	Name of acquisition contractor
H0500	POSITION PROC CONTRACTOR	:	Pettersen AS		Yes	Name of navigation processing contractor
H0600	SEISMIC PROC CONTRACTOR	:	Pettersen AS		Yes	Name of seismic processing contractor
H0700	POSITIONING SYSTEM	:	Fugro Starfix, Pettersen Superfix			
H0800	COORDINATE LOCATION	:	C - CDP	1 1	Yes	Explicit explanation of data-record content
H2600	COORD LOCATION SPECIFIC	:	Common midpoint source and CFG str. 1		Yes	Explanation on how the CMP is derived from use of seismic data
H0800	COORDINATE LOCATION	:	V - Vessel ref.point	1	Yes	Explicit explanation of data-record content
H0800	COORDINATE LOCATION	:	S - Centre source	1 1	Yes	Explicit explanation of data-record content
H0901	VESSEL REF TO SOURCE	:	Crossline: 0.00 Inline: -92.50		Yes	Nominal offset vessel ref. to centre source
H0902	SOURCE TO STREAMER 1	:	Crossline: 0.00 Inline: -72.50		Yes	Nominal offset centre source to streamer 1
H1000	CLOCK STANDARD	:	GPS time from navigation computer		Yes	Explicit definition of timestandard and clock
H1100	RECEIVER GROUPS PER SHOT	:	Recorded 1 X 360, Output 1 X 0			Number of channels recorded, number of receiver-groups in file
H2600						Empty
H1400	GEODETIC DATUM SURVEYED	:	ED50, International 1924, 6378388.00 297.000000		Yes	
H1401	DATUMSHIFT SURVEY TO WGS84	:	-116.6 -56.9 -110.6 +0.893 +0.921 -0.917 -3.52		Yes	
H2600	EPSG CODE H1400/H1401	:	1612		Yes	To be retrieved from the EPSG database
H1500	GEODETIC DATUM POSTPLOT	:	ED50, International 1924, 6378388.00 297.000000		Yes	
H1501	DATUMSHIFT POSTPL TO WGS84	:	-116.6 -56.9 -110.6 +0.893 +0.921 -0.917 -3.52		Yes	
H2600	EPSG CODE H1500/H1501	:	1612		Yes	To be retrieved from the EPSG database
H1600	DATUM SHIFT H1400-H1500	:	0.0 0.0 0.0 0.000 0.000 0.000 0.000		Yes	
H1700	VERTICAL DATUM	:	SL Sea Level		Yes	
H1800	PROJECTION	:	001 UTM northern hemisphere		Yes	
H1900	PROJECTION ZONE	:	36N		Yes	
H2600	EPSG CODE H1800/H1900	:	16036		Yes	To be retrieved from the EPSG database
H2000	GRID UNIT	:	1 Metres 1.000000000000		Yes	
H2001	HEIGHT UNIT	:	1 Metres 1.000000000000		Yes	
H2002	ANGULAR UNIT	:	1 Degrees		Yes	
H2200	LONGITUDE OF CM	:	33 0 0.000E		Yes	Longitude of central meridian
H2301	MAP GRID ORIGIN	:	0 0 0.000N 33 0 0.000E		Yes	Latitude/longitude of map-grid origin
H2302	MAP-GRID COORD. AT ORIGIN	:	500000.00E 0.00N		Yes	Map-grid coordinates at map-grid origin
H2401	SCALE FACTOR	:	0.9996000000		Yes	Map projection scale factor
H2402	LAT/LON WHERE SCALE DEF	:	0 0 0.000N 33 0 0.000E		Yes	Lat/long where scale in card H2401 is defined
H2600	POINT NUMBER	:	Shotpoint-number		Yes	Explain if pointnumber in datarecord is sp.counter, trace counter or another counter
H2600	APPROXIMATE DATA LOCATION	:	Min latitude: 70.6 Max latitude:71.0		Yes	Data bounding box
H2600	APPROXIMATE DATA LOCATION	:	Min longitude: 30.3 Max longitude: 31.9		Yes	Data bounding box

Template - 3D single survey

Type	Standard text	32	Variable text example	ID's	Mandatory	Comment
H0100	SURVEY AREA	:	Norway, Finnmark East, Block 7030/7031		Yes	
H0101	SURVEY DETAILS	:	3D Seismic Survey - OD11005		Yes	
H0102	VESSEL DETAILS	:	MV Petter Ocean	1	Yes	Name and ID of vessel
H0103	SOURCE DETAILS	:	Bolt, Sleeve Gun, starboard	1 1		Name and ID of source
H0103	SOURCE DETAILS	:	Bolt, Sleeve Gun, port	1 2		Name and ID of source
H0104	STREAMER DETAILS	:	Sercel, streamer 1, 640 channels	1 1		Name and ID of streamer
H0104	STREAMER DETAILS	:	Sercel, streamer 2, 640 channels	1 2		Name and ID of streamer
H0104	STREAMER DETAILS	:	Sercel, streamer 3, 640 channels	1 3		Name and ID of streamer
H0104	STREAMER DETAILS	:	Sercel, streamer 4, 640 channels	1 4		Name and ID of streamer
H0104	STREAMER DETAILS	:	Sercel, streamer 5, 640 channels	1 5		Name and ID of streamer
H0104	STREAMER DETAILS	:	Sercel, streamer 6, 640 channels	1 6		Name and ID of streamer
H0200	DATE OF SURVEY	:	05/11 - 06/11		Yes	Start/end month and year of survey (MM/YY)
H0200	DATE OF PROCESSING	:	08/11 - 10/11		Yes	Start/end month and year of seismic processing (MM/YY)
H0201	DATE OF TAPE	:	14/10/11		Yes	Date when data could be exchanged (DD/MM/YY)
H0202	TAPE VERSION ID	:	UKOOA P1/90, Dataset OD11005T11		Yes	Name of dataset to be exchanged
H2600	PROCESSING VERSION	:	Original proc 2011. Final mig. Output in time		Yes	Explicit explanation of accomponying seismic processing
H0203	LINE PREFIX	:				To be used when line-name exceeds 12 characters
H0300	CLIENT NAME	:	NPD		Yes	
H0400	GEOPHYSICAL CONTRACTOR	:	Pettersen AS		Yes	Name of acquisition contractor
H0500	POSITION PROC CONTRACTOR	:	Pettersen AS		Yes	Name of navigation processing contractor
H0600	SEISMIC PROC CONTRACTOR	:	Pettersen AS		Yes	Name of seismic processing contractor
H0700	POSITIONING SYSTEM	:	Fugro Starfix, Pettersen Superfix			
H0800	COORDINATE LOCATION	:	Q - centre cell		Yes	Explicit explanation of data-record content
H0901	VESSEL REF TO SOURCE 1	:	Crossline: +25.00 Inline: -292.50			Nominal offset vessel ref. to centre starboard source
H0902	VESSEL REF TO SOURCE 2	:	Crossline: - 25.00 Inline: -292.50			Nominal offset vessel ref. to centre port source
H0903	VESSEL REF TO STREAMER 1	:	Crossline:+250.00 Inline: -472.50			Nominal offset centre source to streamer 1
H0904	VESSEL REF TO STREAMER 2	:	Crossline:+150.00 Inline: -472.50			Nominal offset centre source to streamer 2
H0905	VESSEL REF TO STREAMER 3	:	Crossline:+ 50.00 Inline: -472.50			Nominal offset centre source to streamer 3
H0906	VESSEL REF TO STREAMER 4	:	Crossline:- 50.00 Inline: -472.50			Nominal offset centre source to streamer 4
H0907	VESSEL REF TO STREAMER 5	:	Crossline:-150.00 Inline: -472.50			Nominal offset centre source to streamer 5
H0908	VESSEL REF TO STREAMER 6	:	Crossline:-250.00 Inline: -472.50			Nominal offset centre source to streamer 6
H1000	CLOCK STANDARD	:	GPS time from navigation computer			Explicit definition of timestandard and clock
H1100	RECEIVER GROUPS PER SHOT	:	Recorded 6 X 640, Output 6 X 0			Number of channels recorded, number of receiver-groups in file
H2600						Empty
H1400	GEODETIC DATUM SURVEYED	:	ED50, International 1924, 6378388.00 297.000000		Yes	
H1401	DATUMSHIFT SURVEY TO WGS84	:	-116.6 -56.9 -110.6 +0.893 +0.921 -0.917 -3.52		Yes	
H2600	EPSG CODE H1400/H1401	:	1612		Yes	To be retrieved from the EPSG database
H1500	GEODETIC DATUM POSTPLOT	:	ED50, International 1924, 6378388.00 297.000000		Yes	
H1501	DATUMSHIFT POSTPL TO WGS84	:	-116.6 -56.9 -110.6 +0.893 +0.921 -0.917 -3.52		Yes	
H2600	EPSG CODE H1500/H1501	:	1612		Yes	To be retrieved from the EPSG database
H1600	DATUM SHIFT H1400-H1500	:	0.0 0.0 0.0 0.000 0.000 0.000 0.000		Yes	
H1700	VERTICAL DATUM	:	SL Sea Level		Yes	
H1800	MAP PROJECTION	:	001 UTM northern hemisphere		Yes	
H1900	PROJECTION ZONE	:	36N		Yes	
H2600	EPSG CODE H1800/H1900	:	16036		Yes	To be retrieved from the EPSG database
H2000	GRID UNIT	:	1 Metres 1.000000000000		Yes	
H2001	HEIGHT UNIT	:	1 Metres 1.000000000000		Yes	
H2002	ANGULAR UNIT	:	1 Degrees		Yes	
H2200	LONGITUDE OF CM	:	33 0 0.000E		Yes	Longitude of central meridian
H2301	MAP GRID ORIGIN	:	0 0 0.000N 33 0 0.000E		Yes	Latitude/longitude of map-grid origin
H2302	MAP-GRID COORD. AT ORIGIN	:	500000.00E 0.00N		Yes	Map-grid coordinates at map-grid origin
H2401	SCALE FACTOR	:	0.9996000000		Yes	Scale factor at map-grid origin
H2402	LAT/LON WHERE SCALE DEF	:	0 0 0.000N 33 0 0.000E		Yes	Combining H2301 and H2401
H2600						Empty
H2600	APPROXIMATE DATA LOCATION	:	Min latitude: 70.6 Max latitude:71.0		Yes	Data bounding box, geographical coordinates
H2600	APPROXIMATE DATA LOCATION	:	Min longitude: 30.6 Max longitude: 31.4		Yes	Data bounding box, geographical coordinates
H2600	BIN GRID ORIGIN	:	Inline = 1, Crossline = 1		Yes	
H2600	MAP GRID EAST AT (1, 1)	:	383477.07		Yes	
H2600	MAP GRID NORTH AT (1, 1)	:	7829621.30		Yes	
H2600	BIN INLINE DIRECTION	:	0.0000000 degrees (clockwise from grid north)		Yes	
H2600	BIN CROSSLINE DIRECTION	:	90.0000000 degrees (clockwise from grid north)		Yes	
H2600	BIN SIZE INLINE DIRECTION	:	12.50 meters		Yes	Distance between cross-lines
H2600	BIN SIZE XLINE DIRECTION	:	25.00 meters		Yes	Distance between inlines
H2600	BIN INCR (INLINES/XLINES)	:	1, 1		Yes	Not to be mis-interpreted as data-record sample increment
H2600	BIN SAMPLING INLINES	:	Every inline		Yes	
H2600	BIN SAMPLING CROSSLINES	:	First, last crossline and every multiple of 50		Yes	
H2600	GROSS INLINES	:	1201 to 2200		Yes	minimum/maximum inline number
H2600	GROSS CROSSLINES	:	1301 to 3300		Yes	minimum/maximum crossline number
H2600	MIN/MAX RECTANGLE	:	Inline Crossline Map grid east Map grid north		Yes	Internal header for next 4 records
H2600	POINT A	:	1201 1301 413477.07 7845871.30		Yes	A machine should be able to draw a line from point A
H2600	POINT B	:	1201 3300 413477.07 7870858.80		Yes	to point B
H2600	POINT C	:	2200 3300 438452.07 7870858.80		Yes	to point C
H2600	POINT D	:	2200 1301 438452.07 7845871.30		Yes	to point D and back to point A
H2600	LIVE DATA POLYGON	:	Inline Crossline Map grid east Map grid north		Yes	Internal header for next n records
H2600	POINT 1	:	1201 1301 413477.07 7845871.30		Yes	A machine should be able to draw a line from point 1
H2600	POINT 2	:	1201 2451 413477.07 7860246.30		Yes	to point 2
H2600	POINT 3	:	1573 2451 422777.07 7860246.30		Yes	to point 3
H2600	POINT 4	:	1573 3300 422777.07 7870858.80		Yes	to point 4
H2600	POINT 5	:	2200 3300 438452.07 7870858.80		Yes	to point 5
H2600	POINT 6	:	2200 1301 438452.07 7845871.30		Yes	to point 6 and back to point 1

Template - 3D merged survey

Type	Standard text	32	Variable text example	ID's	Mandatory	Comment
H0100	SURVEY AREA	:	Norway, Finnmark East, Block 7030/7031		Yes	
H0101	JOB DETAILS	:	Merged 3D survey - OD110005 and OD0705		Yes	
H0102	VESSEL DETAILS	:	N/A (merged survey)			
H0103	SOURCE DETAILS	:	N/A (merged survey)			
H0104	STREAMER DETAILS	:	N/A (merged survey)			
H0200	DATE OF SURVEY	:	N/A (merged survey)		Yes	
H0200	DATE OF PROCESSING	:	08/11 - 10/11		Yes	Start/end month and year of seismic processing (MM/YY)
H0201	DATE OF TAPE	:	05/10/11		Yes	Date when data could be exchanged (DD/MM/YY)
H0202	TAPE VERSION ID	:	UKOOA P1/90, Dataset OD11005MZ11		Yes	Name of dataset to be exchanged
H2600	PROCESSING VERSION	:	Processing 2011. Multiple surveys. Final mig		Yes	Explicit explanation of accomponying seismic processing
H0203	LINE PREFIX	:				To be used when line-name exceeds 12 characters
H0300	CLIENT NAME	:	NPD		Yes	
H0400	GEOPHYSICAL CONTRACTOR	:	N/A (merged survey)			
H0500	POSITION PROC CONTRACTOR	:	N/A (merged survey)			
H0600	SEISMIC PROC CONTRACTOR	:	Pettersen AS		Yes	Name of seismic processing contractor
H0700	POSITIONING SYSTEM	:	N/A (merged survey)			
H0800	COORDINATE LOCATION	:	Q - centre cell		Yes	Explicit explanation of data-record content
H0901	VESSEL REF TO SOURCE	:	N/A (merged survey)			
H0903	VESSEL REF TO STREAMER	:	N/A (merged survey)			
H1000	CLOCK STANDARD	:	N/A (merged survey)			
H1100	RECEIVER GROUPS PER SHOT	:	N/A (merged survey)			
H2600						Empty
H1400	GEODETIC DATUM SURVEYED	:	N/A (merged survey)			
H1401	DATUMSHIFT SURVEY TO WGS84	:	N/A (merged survey)			
H2600	EPSG CODE H1400/H1401	:	N/A			Express contributing survey details using H2600 cards
H1500	GEODETIC DATUM POSTPLOT	:	ED50, International 1924, 6378388.000 297.0000000		Yes	
H1501	DATUMSHIFT POSTPL TO WGS84	:	-116.6 -56.9 -110.6 +0.893 +0.921 -0.917 -3.52		Yes	
H2600	EPSG CODE H1500/H1501	:	1612		Yes	To be retrieved from the EPSG database
H1600	DATUM SHIFT H1400-H1500	:	0.0 0.0 0.0 0.000 0.000 0.000 0.000		Yes	
H1700	VERTICAL DATUM	:	SL Sea Level		Yes	
H1800	MAP PROJECTION	:	001 UTM northern hemisphere		Yes	
H1900	PROJECTION ZONE	:	36N		Yes	
H2600	EPSG CODE H1800/H1900	:	16036		Yes	To be retrieved from the EPSG database
H2000	GRID UNIT	:	1 Metres 1.000000000000		Yes	
H2001	HEIGHT UNIT	:	1 Metres 1.000000000000			
H2002	ANGULAR UNIT	:	1 Degrees		Yes	
H2200	LONGITUDE OF CM	:	33 0 0.000E		Yes	Longitude of central meridian
H2301	MAP GRID ORIGIN	:	0 0 0.000N 33 0 0.000E		Yes	Latitude/longitude of map-grid origin
H2302	MAP-GRID COORD. AT ORIGIN	:	500000.00E 0.00N		Yes	Map-grid coordinates at map-grid origin
H2401	SCALE FACTOR	:	0.9996000000		Yes	Scale factor at map-grid origin
H2402	LAT/LON WHERE SCALE DEF	:	0 0 0.000N 33 0 0.000E		Yes	Combining H2301 and H2401
H2600	CRS COMMENT	:	Contributing surveys share CRS parameters		Yes	IMPORTANT. Different CRS parameters requires attention
H2600						Empty
H2600	APPROXIMATE DATA LOCATION	:	Min latitude: 70.6 Max latitude:71.0		Yes	Data bounding box, geographical coordinates
H2600	APPROXIMATE DATA LOCATION	:	Min longitude: 30.6 Max longitude: 31.4		Yes	Data bounding box, geographical coordinates
H2600	BIN GRID ORIGIN	:	Inline = 1, Crossline = 1		Yes	
H2600	MAP GRID EAST AT (1, 1)	:	383477.07		Yes	
H2600	MAP GRID NORTH AT (1, 1)	:	7829621.30		Yes	
H2600	BIN INLINE DIRECTION	:	0.0000000 degrees (clockwise from grid north)		Yes	
H2600	BIN CROSSLINE DIRECTION	:	90.0000000 degrees (clockwise from grid north)		Yes	
H2600	BIN SIZE INLINE DIRECTION	:	12.50 meters		Yes	Distance between cross-lines
H2600	BIN SIZE XLINE DIRECTION	:	25.00 meters		Yes	Distance between inlines
H2600	BIN INCR (INLINES/XLINES)	:	1, 1		Yes	Not to be mis-interpreted as sample increment
H2600	BIN SAMPLING INLINES	:	All		Yes	
H2600	BIN SAMPLING CROSSLINES	:	First, last and every multiple of 50		Yes	
H2600	GROSS INLINES	:	1201 to 2200		Yes	minimum/maximum inline number
H2600	GROSS CROSSLINES	:	923 to 3300		Yes	minimum/maximum crossline number
H2600	MIN/MAX RECTANGLE	:	Inline Crossline Map grid east Map grid north		Yes	Internal header for next 4 records
H2600	POINT A	:	1201 923 413477.07 7841146.30		Yes	A machine should be able to draw a line from point A
H2600	POINT B	:	1201 3300 413477.07 7870858.80		Yes	to point B
H2600	POINT C	:	2200 3300 438452.07 7870858.80		Yes	to point C
H2600	POINT D	:	2200 923 438452.07 7841146.30		Yes	to point D and back to point A
H2600	LIVE DATA POLYGON	:	Inline Crossline Map grid east Map grid north		Yes	Internal header for next n records
H2600	POINT 1	:	1201 1301 413477.07 7845871.30		Yes	A machine should be able to draw a line from point 1
H2600	POINT 2	:	1201 2451 413477.07 7860246.30		Yes	to point 2
H2600	POINT 3	:	1573 2451 422777.07 7860246.30		Yes	to point 3
H2600	POINT 4	:	1573 3300 422777.07 7870858.80		Yes	to point 4
H2600	POINT 5	:	2200 3300 438452.07 7870858.80		Yes	to point 5
H2600	POINT 6	:	2200 1301 438452.07 7845871.30		Yes	to point 6
H2600	POINT 7	:	2141 1301 436977.07 7845871.30		Yes	to point 7
H2600	POINT 8	:	2141 923 436977.07 7841146.30		Yes	to point 8
H2600	POINT 9	:	1272 923 415252.07 7841146.30		Yes	to point 9
H2600	POINT 10	:	1272 1301 415252.07 7845871.30		Yes	to point 10 and back to point 1
H2600						Empty

H2600	CONTRIBUTING SURVEY 1	:	OD110005		Yes	
H2600	DEMARCATION POLYGON	:	Inline Crossline Map grid east Map grid north		Yes	Internal header for next n records
H2600	POINT 1-1	:	1201 1301 413477.07 7845871.30		Yes	Inline/crossline reference is made to merged data-set
H2600	POINT 1-2	:	1201 2451 413477.07 7860246.30		Yes	
H2600	POINT 1-3	:	1573 2451 422777.07 7860246.30		Yes	
H2600	POINT 1-4	:	1573 3300 422777.07 7870858.80		Yes	
H2600	POINT 1-5	:	2200 3300 438452.07 7870858.80		Yes	
H2600	POINT 1-6	:	2200 1301 438452.07 7845871.30		Yes	
H2600						Empty
H2600	CONTRIBUTING SURVEY 2	:	OD0705		Yes	
H2600	DEMARCATION POLYGON	:	Inline Crossline Map grid east Map grid north		Yes	Internal header for next n records
H2600	POINT 2-1	:	1272 923 415252.07 7841146.30		Yes	Inline/crossline reference is made to merged data-set
H2600	POINT 2-2	:	1272 1301 415252.07 7845871.30		Yes	
H2600	POINT 2-3	:	2141 1301 436977.07 7845871.30		Yes	
H2600	POINT 2-4	:	2141 923 436977.07 7841146.30		Yes	
H2600						Empty
H2600	SURVEY 1 ORIG. P1 HEADER	:	ORIGINAL P1 HEADER FOR OD110005		Yes	
H0100	SURVEY AREA	:	Norway, Finnmark East, Block 7030/7031			Mandatory with respect to being part of an original P1 header
H0101	SURVEY DETAILS	:	3D Seismic Survey - OD11005			Mandatory with respect to being part of an original P1 header
H0102	VESSEL DETAILS	:	MV Petter Ocean	1		Mandatory with respect to being part of an original P1 header
H0103	SOURCE DETAILS	:	Bolt, Sleeve Gun, starboard	1 1		Mandatory with respect to being part of an original P1 header
H0103	SOURCE DETAILS	:	Bolt, Sleeve Gun, port	1 2		Mandatory with respect to being part of an original P1 header
H0104	STREAMER DETAILS	:	Sercel, streamer 1, 640 channels	1 1		Mandatory with respect to being part of an original P1 header
H0104	STREAMER DETAILS	:	Sercel, streamer 2, 640 channels	1 2		Mandatory with respect to being part of an original P1 header
H0104	STREAMER DETAILS	:	Sercel, streamer 3, 640 channels	1 3		Mandatory with respect to being part of an original P1 header
H0104	STREAMER DETAILS	:	Sercel, streamer 4, 640 channels	1 4		Mandatory with respect to being part of an original P1 header
H0104	STREAMER DETAILS	:	Sercel, streamer 5, 640 channels	1 5		Mandatory with respect to being part of an original P1 header
H0104	STREAMER DETAILS	:	Sercel, streamer 6, 640 channels	1 6		Mandatory with respect to being part of an original P1 header
H0200	DATE OF SURVEY	:	05/11 - 06/11			Mandatory with respect to being part of an original P1 header
H0200	DATE OF PROCESSING	:	08/11 - 10/11			Mandatory with respect to being part of an original P1 header
H0201	DATE OF TAPE	:	14/10/11			Mandatory with respect to being part of an original P1 header
H0202	TAPE VERSION ID	:	UKOOA P1/90, Dataset OD11005T11			Mandatory with respect to being part of an original P1 header
H2600	PROCESSING VERSION	:	Original proc 2011. Final mig. Output in time			Mandatory with respect to being part of an original P1 header
H0203	LINE PREFIX	:				Mandatory with respect to being part of an original P1 header
H0300	CLIENT NAME	:	NPD			Mandatory with respect to being part of an original P1 header
H0400	GEOPHYSICAL CONTRACTOR	:	Pettersen AS			Mandatory with respect to being part of an original P1 header
H0500	POSITION PROC CONTRACTOR	:	Pettersen AS			Mandatory with respect to being part of an original P1 header
H0600	SEISMIC PROC CONTRACTOR	:	Pettersen AS			Mandatory with respect to being part of an original P1 header
H0700	POSITIONING SYSTEM	:	Fugro Starfix, Pettersen Superfix			Mandatory with respect to being part of an original P1 header
H0800	COORDINATE LOCATION	:	Q - centre cell			Mandatory with respect to being part of an original P1 header
H0901	VESSEL REF TO SOURCE 1	:	Crossline: +25.00 Inline: -292.50			Mandatory with respect to being part of an original P1 header
H0902	VESSEL REF TO SOURCE 2	:	Crossline: - 25.00 Inline: -292.50			Mandatory with respect to being part of an original P1 header
H0903	VESSEL REF TO STREAMER 1	:	Crossline:+250.00 Inline: -472.50			Mandatory with respect to being part of an original P1 header
H0904	VESSEL REF TO STREAMER 2	:	Crossline:+150.00 Inline: -472.50			Mandatory with respect to being part of an original P1 header
H0905	VESSEL REF TO STREAMER 3	:	Crossline:+ 50.00 Inline: -472.50			Mandatory with respect to being part of an original P1 header
H0906	VESSEL REF TO STREAMER 4	:	Crossline:- 50.00 Inline: -472.50			Mandatory with respect to being part of an original P1 header
H0907	VESSEL REF TO STREAMER 5	:	Crossline:-150.00 Inline: -472.50			Mandatory with respect to being part of an original P1 header
H0908	VESSEL REF TO STREAMER 6	:	Crossline:-250.00 Inline: -472.50			Mandatory with respect to being part of an original P1 header
H1000	CLOCK STANDARD	:	GPS time from navigation computer			Mandatory with respect to being part of an original P1 header
H1100	RECEIVER GROUPS PER SHOT	:	Recorded 6 X 640, Output 6 X 0			Mandatory with respect to being part of an original P1 header
H2600						Mandatory with respect to being part of an original P1 header
H1400	GEODETIC DATUM SURVEYED	:	ED50, International 1924, 6378388.00 297.000000			Mandatory with respect to being part of an original P1 header
H1401	DATUMSHIFT SURVEY TO WGS84	:	-116.6 -56.9 -110.6 +0.893 +0.921 -0.917 -3.52			Mandatory with respect to being part of an original P1 header
H2600	EPSG CODE H1400/H1401	:	1612			Mandatory with respect to being part of an original P1 header
H1500	GEODETIC DATUM POSTPLOT	:	ED50, International 1924, 6378388.00 297.000000			Mandatory with respect to being part of an original P1 header
H1501	DATUMSHIFT POSTPL TO WGS84	:	-116.6 -56.9 -110.6 +0.893 +0.921 -0.917 -3.52			Mandatory with respect to being part of an original P1 header
H2600	EPSG CODE H1500/H1501	:	1612			Mandatory with respect to being part of an original P1 header
H1600	DATUM SHIFT H1400-H1500	:	0.0 0.0 0.0 0.000 0.000 0.000 0.000			Mandatory with respect to being part of an original P1 header
H1700	VERTICAL DATUM	:	SL Sea Level			Mandatory with respect to being part of an original P1 header
H1800	MAP PROJECTION	:	001 UTM northern hemisphere			Mandatory with respect to being part of an original P1 header
H1900	PROJECTION ZONE	:	36N			Mandatory with respect to being part of an original P1 header
H2600	EPSG CODE H1800/H1900	:	16036			Mandatory with respect to being part of an original P1 header
H2000	GRID UNIT	:	1 Metres 1.000000000000			Mandatory with respect to being part of an original P1 header
H2001	HEIGHT UNIT	:	1 Metres 1.000000000000			Mandatory with respect to being part of an original P1 header
H2002	ANGULAR UNIT	:	1 Degrees			Mandatory with respect to being part of an original P1 header
H2200	LONGITUDE OF CM	:	33 0 0.000E			Mandatory with respect to being part of an original P1 header
H2301	MAP GRID ORIGIN	:	0 0 0.000N 33 0 0.000E			Mandatory with respect to being part of an original P1 header
H2302	MAP-GRID COORD. AT ORIGIN	:	500000.00E 0.00N			Mandatory with respect to being part of an original P1 header
H2401	SCALE FACTOR	:	0.9996000000			Mandatory with respect to being part of an original P1 header
H2402	LAT/LON WHERE SCALE DEF	:	0 0 0.000N 33 0 0.000E			Mandatory with respect to being part of an original P1 header
H2600						Mandatory with respect to being part of an original P1 header
H2600	APPROXIMATE DATA LOCATION	:	Min latitude: 70.6 Max latitude:71.0			Mandatory with respect to being part of an original P1 header
H2600	APPROXIMATE DATA LOCATION	:	Min longitude: 30.6 Max longitude: 31.4			Mandatory with respect to being part of an original P1 header
H2600	BIN GRID ORIGIN	:	Inline = 1, Crossline = 1			Mandatory with respect to being part of an original P1 header
H2600	MAP GRID EAST AT (1, 1)	:	383477.07			Mandatory with respect to being part of an original P1 header

H2600	MAP GRID NORTH AT (1, 1)	:	7829621.30			Mandatory with respect to being part of an original P1 header
H2600	BIN INLINE DIRECTION	:	0.0000000 degrees (clockwise from grid north)			Mandatory with respect to being part of an original P1 header
H2600	BIN CROSSLINE DIRECTION	:	90.0000000 degrees (clockwise from grid north)			Mandatory with respect to being part of an original P1 header
H2600	BIN SIZE INLINE DIRECTION	:	12.50 meters			Mandatory with respect to being part of an original P1 header
H2600	BIN SIZE XLINE DIRECTION	:	25.00 meters			Mandatory with respect to being part of an original P1 header
H2600	BIN INCR (INLINES/XLINES)	:	1, 1			Mandatory with respect to being part of an original P1 header
H2600	BIN SAMPLING INLINES	:	Every inline			Mandatory with respect to being part of an original P1 header
H2600	BIN SAMPLING CROSSLINES	:	First, last crossline and every multiple of 50			Mandatory with respect to being part of an original P1 header
H2600	GROSS INLINES	:	1201 to 2200			Mandatory with respect to being part of an original P1 header
H2600	GROSS CROSSLINES	:	1301 to 3300			Mandatory with respect to being part of an original P1 header
H2600	MIN/MAX RECTANGLE	:	Inline Crossline Map grid east Map grid north			Mandatory with respect to being part of an original P1 header
H2600	POINT A	:	1201 1301 413477.07 7845871.30			Mandatory with respect to being part of an original P1 header
H2600	POINT B	:	1201 3300 413477.07 7870858.80			Mandatory with respect to being part of an original P1 header
H2600	POINT C	:	2200 3300 438452.07 7870858.80			Mandatory with respect to being part of an original P1 header
H2600	POINT D	:	2200 1301 438452.07 7845871.30			Mandatory with respect to being part of an original P1 header
H2600	LIVE DATA POLYGON	:	Inline Crossline Map grid east Map grid north			Mandatory with respect to being part of an original P1 header
H2600	POINT 1	:	1201 1301 413477.07 7845871.30			Mandatory with respect to being part of an original P1 header
H2600	POINT 2	:	1201 2451 413477.07 7860246.30			Mandatory with respect to being part of an original P1 header
H2600	POINT 3	:	1573 2451 422777.07 7860246.30			Mandatory with respect to being part of an original P1 header
H2600	POINT 4	:	1573 3300 422777.07 7870858.80			Mandatory with respect to being part of an original P1 header
H2600	POINT 5	:	2200 3300 438452.07 7870858.80			Mandatory with respect to being part of an original P1 header
H2600	POINT 6	:	2200 1301 438452.07 7845871.30			Mandatory with respect to being part of an original P1 header
H2600						Empty
H2600	SURVEY 2 ORIG. P1 HEADER	:	ORIGINAL P1 HEADER FOR OD0705		Yes	
H0100	SURVEY AREA	:	Norway, Finnmark East, Block 7030/7031			Mandatory with respect to being part of an original P1 header
H0101	SURVEY DETAILS	:	3D Seismic Survey - OD0705			Mandatory with respect to being part of an original P1 header
H0102	VESSEL DETAILS	:	MV Petter Ocean	1		Mandatory with respect to being part of an original P1 header
H0103	SOURCE DETAILS	:	Bolt, Sleeve Gun, starboard	1 1		Mandatory with respect to being part of an original P1 header
H0103	SOURCE DETAILS	:	Bolt, Sleeve Gun, port	1 2		Mandatory with respect to being part of an original P1 header
H0104	STREAMER DETAILS	:	Sercel, streamer 1, 640 channels	1 1		Mandatory with respect to being part of an original P1 header
H0104	STREAMER DETAILS	:	Sercel, streamer 2, 640 channels	1 2		Mandatory with respect to being part of an original P1 header
H0104	STREAMER DETAILS	:	Sercel, streamer 3, 640 channels	1 3		Mandatory with respect to being part of an original P1 header
H0104	STREAMER DETAILS	:	Sercel, streamer 4, 640 channels	1 4		Mandatory with respect to being part of an original P1 header
H0200	DATE OF SURVEY	:	08/07 - 08/07			Mandatory with respect to being part of an original P1 header
H0200	DATE OF PROCESSING	:	08/11 - 10/11			Mandatory with respect to being part of an original P1 header
H0201	DATE OF TAPE	:	14/10/11			Mandatory with respect to being part of an original P1 header
H0202	TAPE VERSION ID	:	UKOOA P1/90, Dataset OD0705T11			Mandatory with respect to being part of an original P1 header
H2600	PROCESSING VERSION	:	Reproc 2011. Final mig. Output in time			Mandatory with respect to being part of an original P1 header
H0203	LINE PREFIX	:				Mandatory with respect to being part of an original P1 header
H0300	CLIENT NAME	:	NPD			Mandatory with respect to being part of an original P1 header
H0400	GEOPHYSICAL CONTRACTOR	:	Pettersen AS			Mandatory with respect to being part of an original P1 header
H0500	POSITION PROC CONTRACTOR	:	Pettersen AS			Mandatory with respect to being part of an original P1 header
H0600	SEISMIC PROC CONTRACTOR	:	Pettersen AS			Mandatory with respect to being part of an original P1 header
H0700	POSITIONING SYSTEM	:	Fugro Starfix, Pettersen Superfix			Mandatory with respect to being part of an original P1 header
H0800	COORDINATE LOCATION	:	Q - centre cell			Mandatory with respect to being part of an original P1 header
H0901	VESSEL REF TO SOURCE 1	:	Crossline: +25.00 Inline: -292.50			Mandatory with respect to being part of an original P1 header
H0902	VESSEL REF TO SOURCE 2	:	Crossline: - 25.00 Inline: -292.50			Mandatory with respect to being part of an original P1 header
H0904	VESSEL REF TO STREAMER 1	:	Crossline:+150.00 Inline: -472.50			Mandatory with respect to being part of an original P1 header
H0905	VESSEL REF TO STREAMER 2	:	Crossline:+ 50.00 Inline: -472.50			Mandatory with respect to being part of an original P1 header
H0906	VESSEL REF TO STREAMER 3	:	Crossline:- 50.00 Inline: -472.50			Mandatory with respect to being part of an original P1 header
H0907	VESSEL REF TO STREAMER 4	:	Crossline:-150.00 Inline: -472.50			Mandatory with respect to being part of an original P1 header
H1000	CLOCK STANDARD	:	GPS time from navigation computer			Mandatory with respect to being part of an original P1 header
H1100	RECEIVER GROUPS PER SHOT	:	Recorded 4 X 480, Output 4 X 0			Mandatory with respect to being part of an original P1 header
H2600						Mandatory with respect to being part of an original P1 header
H1400	GEODETIC DATUM SURVEYED	:	ED50, International 1924, 6378388.00 297.000000			Mandatory with respect to being part of an original P1 header
H1401	DATUMSHIFT SURVEY TO WGS84	:	-116.6 -56.9 -110.6 +0.893 +0.921 -0.917 -3.52			Mandatory with respect to being part of an original P1 header
H2600	EPSG CODE H1400/H1401	:	1612			Mandatory with respect to being part of an original P1 header
H1500	GEODETIC DATUM POSTPLOT	:	ED50, International 1924, 6378388.00 297.000000			Mandatory with respect to being part of an original P1 header
H1501	DATUMSHIFT POSTPL TO WGS84	:	-116.6 -56.9 -110.6 +0.893 +0.921 -0.917 -3.52			Mandatory with respect to being part of an original P1 header
H2600	EPSG CODE H1500/H1501	:	1612			Mandatory with respect to being part of an original P1 header
H1600	DATUM SHIFT H1400-H1500	:	0.0 0.0 0.0 0.000 0.000 0.000 0.000			Mandatory with respect to being part of an original P1 header
H1700	VERTICAL DATUM	:	SL Sea Level			Mandatory with respect to being part of an original P1 header
H1800	MAP PROJECTION	:	001 UTM northern hemisphere			Mandatory with respect to being part of an original P1 header
H1900	PROJECTION ZONE	:	36N			Mandatory with respect to being part of an original P1 header
H2600	EPSG CODE H1800/H1900	:	16036			Mandatory with respect to being part of an original P1 header
H2000	GRID UNIT	:	1 Metres 1.000000000000			Mandatory with respect to being part of an original P1 header
H2001	HEIGHT UNIT	:	1 Metres 1.000000000000			Mandatory with respect to being part of an original P1 header
H2002	ANGULAR UNIT	:	1 Degrees			Mandatory with respect to being part of an original P1 header
H2200	LONGITUDE OF CM	:	33 0 0.000E			Mandatory with respect to being part of an original P1 header
H2301	MAP GRID ORIGIN	:	0 0 0.000N 33 0 0.000E			Mandatory with respect to being part of an original P1 header
H2302	MAP-GRID COORD. AT ORIGIN	:	500000.00E 0.00N			Mandatory with respect to being part of an original P1 header
H2401	SCALE FACTOR	:	0.9996000000			Mandatory with respect to being part of an original P1 header
H2402	LAT/LON WHERE SCALE DEF	:	0 0 0.000N 33 0 0.000E			Mandatory with respect to being part of an original P1 header
H2600						Mandatory with respect to being part of an original P1 header

H2600	APPROXIMATE DATA LOCATION	:	Min latitude: 70.6 Max latitude:70.8			Mandatory with respect to being part of an original P1 header
H2600	APPROXIMATE DATA LOCATION	:	Min longitude: 30.6 Max longitude: 31.4			Mandatory with respect to being part of an original P1 header
H2600	BIN GRID ORIGIN	:	Inline = 1, Crossline = 1			Mandatory with respect to being part of an original P1 header
H2600	MAP GRID EAST AT (1, 1)	:	390258.77			Mandatory with respect to being part of an original P1 header
H2600	MAP GRID NORTH AT (1, 1)	:	7828644.77			Mandatory with respect to being part of an original P1 header
H2600	BIN INLINE DIRECTION	:	0.0000000 degrees (clockwise from grid north)			Mandatory with respect to being part of an original P1 header
H2600	BIN CROSSLINE DIRECTION	:	90.0000000 degrees (clockwise from grid north)			Mandatory with respect to being part of an original P1 header
H2600	BIN SIZE INLINE DIRECTION	:	12.50 meters			Mandatory with respect to being part of an original P1 header
H2600	BIN SIZE XLINE DIRECTION	:	25.00 meters			Mandatory with respect to being part of an original P1 header
H2600	BIN INCR (INLINES/XLINES)	:	1, 1			Mandatory with respect to being part of an original P1 header
H2600	BIN SAMPLING INLINES	:	Every inline			Mandatory with respect to being part of an original P1 header
H2600	BIN SAMPLING CROSSLINES	:	First, last crossline and every multiple of 50			Mandatory with respect to being part of an original P1 header
H2600	GROSS INLINES	:	1001 to 1870			Mandatory with respect to being part of an original P1 header
H2600	GROSS CROSSLINES	:	1001 to 1645			Mandatory with respect to being part of an original P1 header
H2600	MIN/MAX RECTANGLE	:	Inline Crossline Map grid east Map grid north			Mandatory with respect to being part of an original P1 header
H2600	POINT A	:	1001 1001 415258.77 7841144.77			Mandatory with respect to being part of an original P1 header
H2600	POINT B	:	1001 1645 415258.77 7849194.77			Mandatory with respect to being part of an original P1 header
H2600	POINT C	:	1870 1645 436983.77 7849194.77			Mandatory with respect to being part of an original P1 header
H2600	POINT D	:	1870 1001 436983.77 7841144.77			Mandatory with respect to being part of an original P1 header
H2600	LIVE DATA POLYGON	:	Inline Crossline Map grid east Map grid north			Mandatory with respect to being part of an original P1 header
H2600	POINT 1	:	1001 1001 415258.77 7841144.77			Mandatory with respect to being part of an original P1 header
H2600	POINT 2	:	1001 1645 415258.77 7849194.77			Mandatory with respect to being part of an original P1 header
H2600	POINT 3	:	1870 1645 436983.77 7849194.77			Mandatory with respect to being part of an original P1 header
H2600	POINT 4	:	1870 1001 436983.77 7841144.77			Mandatory with respect to being part of an original P1 header

Appendix C – Formats for seismic velocity data

Finely gridded velocity models (after auto-picking or depth migration) are to be provided in SEG-Y format, refer to Appendix A for more information. Hand-picked velocities are to be provided in DiskosV98 format, as described below.

Description of DiskosV98.1 format

This ASCII format is based on the COPEX format and consists of COPEX identifiers, keywords, values, units and comments which are described below. This format is intended for files on disk only. If files are required on tape it is recommended they are copied from disk using TAR format.

COPEX identifiers

These identify the start, end and data content of a COPEX file, as follows:

```
::COPEX::                    # start of a file #
DataType: Velocity data      # data content of a file #
::Goodbye::                  # end of a file #
```

Refer to the Examples section for an illustration of their use.

Keywords

A keyword consists of a single word terminated by an equals sign (=). It may be followed immediately by a value, useful for header type information. Also, keywords can be specified immediately after each other so as to define the columns of a table. The first keyword in such a table layout should be either Line= or Iline=.

Refer to the Usage Table and Abbreviations sections to see which keywords are mandatory (M) and the conditions which apply.

Note that the inclusion of coordinates is not mandatory, but if included, can either be latitude and longitude or UTM Easting and Northing, or both.

Values

If a value is not a single word, it should be enclosed by a pair of double quotes (O). Using the tilda (˜) character causes a value to be repeated until it is respecified. However, we urge use of explicit values instead of this character. An absent value should be indicated by either an empty pair of double quotes or by the term void.

Refer to the Usage Table and Abbreviations sections for an illustration of values and the format restrictions which apply.

Units

Some keywords require a unit to be specified, enclosed by a pair of double quotes. In the case of a table layout, if a unit is not applicable for a keyword, it should be treated as an absent value, i.e. using either an empty pair of double quotes or the term void.

Refer to the Usage Table and Abbreviations sections to see which keywords require units and a list of the legal units.

Comments

Comments can be inserted anywhere and can be specified in either of two ways:

start with /* and end with */
start and end with a pound sign (#), or start with # and continue to the end of a line.
To extend onto the next line use a backslash (\) at the end of the line

Usage Table

Keyword
Usage / Purpose
Typical value
Format
Units

Format= M
Version of Diskos velocity format
DiskosV98.1
DiskosVnn.n
No unit

IssueDate= M
Date of issue of file, i.e. by processing contractor
1997-01-29
yyyy-mm-dd
No unit

IssueVersion= M
Issue version, i.e. by processing contractor
Final

No unit

Comments=
Additional information
File generated by PetroBank

No unit

Operator= M
Processing operator (client)
NPD
Max. 40 char

No unit

SurveyType=
2D or 3D survey
3D
Max. 40 char
No unit

SeismicProject= M
PetroBank seismic project name
NN9001-R99
Max. 40 char
No unit

ProjectType= M
PetroBank seismic project type
Filtered stack
Max. 40 char
No unit

VelocitySet=
PetroBank velocity set name
Smoothed set
Max. 40 char
No unit

VelocityType=
PetroBank velocity type
Stacked
Max. 40 char
No unit

Area= M
Geographic area
North Sea
Max. 40 char
No unit

Country= M
Country
Norway
Max. 40 char
No unit

ProcContr= M
Seismic processing contractor
Seismic Processing Company Y
Max. 40 char
No unit

ProjectNo=
Processing contractor project number
1234

No unit

Datum= M (1) (4)
Geodetic datum
ED50
Max. 40 char
No unit

Ellipsoid= M (1) (4)
Ellipsoid
International 1924
Max. 40 char
No unit

Projection= M (1)
Projection
UTM zone 31
UTM zone nn
No unit

CentralMeridian= M (1)
Central meridian
3 deg east

deg

DomainType= M
Velocity domain, i.e. time or depth
Time

No unit

ProcSeq=
Processing sequence and grid definition
See example

No unit

Line= M (2)
Line name, for 2D or non-binned 3D data
NN9601-1001
Max. 40 char
No unit

ILine= M (2)
Inline, for 3D binned data

1001
Max. 40 char
No unit

SP= M (3)
Shotpoint, for 2D or non-binned 3D data
10
Number
No unit

CDP= M (3)
CDP, for 2D or non-binned 3D data
101
Number
No unit

XLine= M (3)
Crossline, for 3D binned data
1
Number
No unit

Easting=
Easting of shotpoint, CDP or crossline
656241.1
xxxxxx.x
m

Northing=
Northing of shotpoint, CDP or crossline
6796333.1
yyyyyyy.y
m

Lat= (5)
Latitude of shotpoint, CDP or crossline
610507.01
DDMMSS.ss
DDMMSS.ss

NS= M (4)
Latitude hemisphere
N
Max. 1 char
No unit

Long= (5)
Longitude of shotpoint, CDP or crossline
1201234.56
DDDMMSS.ss

DDDMMSS.ss

EW= M (4)
Longitude hemisphere
E
Max. 1 char
No unit

TimeDepth= M
Time or depth of velocity
1000
Number
s, ms, m, ft

Vel= M
Velocity
500
Number
m/s, ft/s

Abbreviations:

M Mandatory
(1) Mandatory if X= and Y= values specified
(2) Either Line= or Iline= is mandatory as the first column in the table
(3) A minimum of one is mandatory
(4) Mandatory if Lat= and Long= values specified respectively
(5) Do not prefix value with +/-, use NS= and EW= keywords to indicate hemisphere
D = degrees
M = minutes
S.s = seconds.decimalseconds
m = metres
ft = feet
s = seconds
ms = milliseconds
m/s = metres per second
ft/s = feet per second

Examples

Example of 3D velocity data in DISKOS format

```
::COPEX::
Section: "Velocity data"
Format= "DISKOSV98.1"
IssueDate= "1999-12-01"
IssueVersion= "Final"
Comments= "File generated by ABC"
Operator= "Oil Company X"
SurveyType= "3D"
SeismicProject= "NN9601"
ProjectType= "Filtered Stack"
VelocitySet= "Smoothed set"
VelocityType= "Stack"
Area= "North Sea"
Country= "Norway"
ProcContr= "Seismic Processing Company Y"
ProjectNo= "P1234"
Datum= "ED50"
Ellipsoid= "International 1924"
Projection= "UTM zone 31"
CentralMeridian= "3 deg east"
DomainType= "time"
ProcSeq= "NORMAL MOVEOUT -USING A SPACE INVARIANT AVERAGE VELOCITY
FK VELOCITY FILTER - DIPS +/- 12.5 MSEC/TR, FULL COSINE TAPER APPLIED
INVERSE NORMAL MOVEOUT & DESIGNATURE APPLIED
VELOCITY ANALYSIS - USING 19 DEPTH POINT VELSCANS ON A 2.0 KM GRID
FK DEMULTIPLE -VELNP=85000 M/SEC, SPATIALLY INTERLEAVED
KIRCHHOFF DIP MOVEOUT - USING 30 OFFSET PLANES, IMAGING TO 60 DEGREES
VELOCITY ANALYSIS - USING 19 DEPTH POINT VELSCANS ON A 0.5 KM GRID
DECONVOLUTION - 1 X 160 MSEC ACTIVE FILTER LENGTH + 32 MSEC GAP
TIME VARIANT SCALING - FLATTVS USING 1000 MS GATES, OPX 153/3138:100/3000 MS
NORMAL MOVEOUT CORRECTION AND FIRST BREAK SUPPRESSION APPLIED
COMMON DEPTH POINT STACK -30 FOLD CDP STACK
DECONVOLUTION - 1 * ZW1 MS ACT.FILTER LENGTH + ZW GAP, ZW1=WB * 0.3,
F-X DECONVOLUTION -ENHANCE V4. ADDBK=90/40, GATE = 500 MS/500 TRA
CROSSLINE INTERPOLATION - FROM 25 M TO 12.5 M LINE SPACING USING STDINTERP
MIGRATION-ONE PASS 3D HDT MIG. WITH GLOBAL DILATION TO GIVE EQUIV.DEPTH MIG.
TRANSMISSION DECONVOLUTION-FREQ.COMP. ONLY,SMASH 999 TRACES,NOISE=10 PERCENT
NOISE SUPPRESSION -K FILTER, AND ZERO PHASING FILTER APPLIED
TIME VARIANT FILTER-FREQ(HZ)/TIME(MS) 8-65/500,8-55/1500,8-45/3000,8-40/5000
TIME VARIANT SCALING-SQUARE ROOT SCALING USING 500MS GATE,OVERLAP 50 PERCENT
GRID ORIGIN 1,1(406214.9872,6076140.6143) CELL SIZE 25M X 25M
AZIMUTH 90 DEG"
#
#
Iline= Xline= X=      Y=       Lat=      NS=  Long=      EW=  TimeDepth=  Vel=
""     ""     "m"     "m"      "deg"      ""  "deg"      ""   "s"          "m/s"
1001   1001   222222  6796333  554433.22 N    1112233.44 E    .325         1480
1001   1001   222222  6796333  554433.22 N    1112233.44 E    .575         1638
1001   1001   222222  6796333  554433.22 N    1112233.44 E    .775         1780
1001   1001   222222  6796333  554433.22 N    1112233.44 E    1.050        1913
1001   1001   222222  6796333  554433.22 N    1112233.44 E    2.225        1958
1001   1001   222222  6796333  554433.22 N    1112233.44 E    3.550        2010
1001   1001   222222  6796333  554433.22 N    1112233.44 E    4.875        2039
1001   1001   222222  6796333  554433.22 N    1112233.44 E    5.350        2207
1001   1001   222222  6796333  554433.22 N    1112233.44 E    6.000        4193
1001   2000   333333  6796333  559999.22 N    1112233.44 E    .325         1480
1001   2000   333333  6796333  559999.22 N    1112233.44 E    .575         1638
1001   2000   333333  6796333  559999.22 N    1112233.44 E    .775         1780
1001   2000   333333  6796333  559999.22 N    1112233.44 E    1.050        1913
1001   2000   333333  6796333  559999.22 N    1112233.44 E    2.225        1958
1001   2000   333333  6796333  559999.22 N    1112233.44 E    3.550        2010
1001   2000   333333  6796333  559999.22 N    1112233.44 E    4.875        2039
1001   2000   333333  6796333  559999.22 N    1112233.44 E    5.350        2207
1001   2000   333333  6796333  559999.22 N    1112233.44 E    6.000        4193
3000   1001   444444  6796333  554666.22 N    1112233.44 E    .325         1480
```

```
3000   1001   444444  6796333  554666.22 N    1112233.44 E    .575        1638
3000   1001   444444  6796333  554666.22 N    1112233.44 E    .775        1780
3000   1001   444444  6796333  554666.22 N    1112233.44 E    1.050       1913
3000   1001   444444  6796333  554666.22 N    1112233.44 E    2.225       1958
3000   1001   444444  6796333  554666.22 N    1112233.44 E    3.550       2010
3000   1001   444444  6796333  554666.22 N    1112233.44 E    4.875       2039
3000   1001   444444  6796333  554666.22 N    1112233.44 E    5.350       2207
3000   1001   444444  6796333  554666.22 N    1112233.44 E    6.000       4193
3000   2000   555555  6796333  554433.22 N    1112233.44 E    .325        1480
3000   2000   555555  6796333  554433.22 N    1112233.44 E    .575        1638
3000   2000   555555  6796333  554433.22 N    1112233.44 E    .775        1780
3000   2000   555555  6796333  554433.22 N    1112233.44 E    1.050       1913
3000   2000   555555  6796333  554433.22 N    1112233.44 E    2.225       1958
3000   2000   555555  6796333  554433.22 N    1112233.44 E    3.550       2010
3000   2000   555555  6796333  554433.22 N    1112233.44 E    4.875       2039
3000   2000   555555  6796333  554433.22 N    1112233.44 E    5.350       2207
3000   2000   555555  6796333  554433.22 N    1112233.44 E    6.000       4193
::Goodbye::

#
# Example of 2D velocity data in DISKOS format
#
# ------------------------------------------
::COPEX::
Section: "Velocity data"
Format= "DISKOSV98.1"
IssueDate= "1997-01-29"
IssueVersion= "Final"
Operator= "Oil Company W"
SurveyType= ""
SeismicProject= "ABC9601"
ProjectType= "Filtered Stack"
Area= "North Sea"
Country= "Norway"
ProcContr= "Seismic Processing Company Z"
ProjectNo= void
Datum= "ED50"
Ellipsoid= "International 1924"
DomainType= "time"
#
#
Line=  SP=                  Lat=      NS=  Long=      EW=  TimeDepth=  Vel=
void   ""                   "deg"     ""   "deg"      ""   "s"         "m/s"
ABC-1  15                   050403.22 N    1112233.44 E    .325        1480
ABC-1  15                   050403.22 N    1112233.44 E    .575        1638
ABC-1  15                   050403.22 N    1112233.44 E    .775        1780
ABC-1  15                   050403.22 N    1112233.44 E    1.050       1913
ABC-1  15                   050403.22 N    1112233.44 E    2.225       1958
ABC-1  15                   050403.22 N    1112233.44 E    3.550       2010
ABC-1  15                   050403.22 N    1112233.44 E    4.875       2039
ABC-1  15                   050403.22 N    1112233.44 E    5.350       2207
ABC-1  15                   050403.22 N    1112233.44 E    6.000       4193
ABC-1  115                  050403.32 N    1112233.45 E    .325        1480
ABC-1  115                  050403.32 N    1112233.45 E    .575        1638
ABC-1  115                  050403.32 N    1112233.45 E    .775        1780
ABC-1  115                  050403.32 N    1112233.45 E    1.050       1913
ABC-1  115                  050403.32 N    1112233.45 E    2.225       1958
ABC-1  115                  050403.32 N    1112233.45 E    3.550       2010
ABC-1  115                  050403.32 N    1112233.45 E    4.875       2039
ABC-1  115                  050403.32 N    1112233.45 E    5.350       2207
ABC-1  115                  050403.32 N    1112233.45 E    6.000       4193
ABC-1  215                  050403.52 N    1112233.47 E   .325         1480
ABC-1  215                  050403.52 N    1112233.47 E   .575         1638
ABC-1  215                  050403.52 N    1112233.47 E   .775         1780
ABC-1  215                  050403.52 N    1112233.47 E   1.050        1913
ABC-1  215                  050403.52 N    1112233.47 E   2.225        1958
ABC-1  215                  050403.52 N    1112233.47 E   3.550        2010
ABC-1  215                  050403.52 N    1112233.47 E   4.875        2039
```

```
ABC-1  215                    050403.52 N    1112233.47 E   5.350        2207
ABC-1  215                    050403.52 N    1112233.47 E   6.000        4193
ABC-9  12                     050403.22 N    1112243.44 E   .325         1480
ABC-9  12                     050403.22 N    1112243.44 E   .575         1638
ABC-9  12                     050403.22 N    1112243.44 E   .775         1780
ABC-9  12                     050403.22 N    1112243.44 E   1.050        1913
ABC-9  12                     050403.22 N    1112243.44 E   2.225        1958
ABC-9  12                     050403.22 N    1112243.44 E   3.550        2010
ABC-9  12                     050403.22 N    1112243.44 E   4.875        2039
ABC-9  12                     050403.22 N    1112243.44 E   5.350        2207
ABC-9  12                     050403.22 N    1112243.44 E   6.000        4193
ABC-9  112                    050404.22 N    1112243.45 E   .325         1480
ABC-9  112                    050404.22 N    1112243.45 E   .575         1638
ABC-9  112                    050404.22 N    1112243.45 E   .775         1780
ABC-9  112                    050404.22 N    1112243.45 E   1.050        1913
ABC-9  112                    050404.22 N    1112243.45 E   2.225        1958
ABC-9  112                    050404.22 N    1112243.45 E   3.550        2010
ABC-9  112                    050404.22 N    1112243.45 E   4.875        2039
ABC-9  112                    050404.22 N    1112243.45 E   5.350        2207
ABC-9  112                    050404.22 N    1112243.45 E   6.000        4193
ABC-9  212                    050403.32 N    1112243.47 E   .325         1480
ABC-9  212                    050403.32 N    1112243.47 E   .575         1638
ABC-9  212                    050403.32 N    1112243.47 E   .775         1780
ABC-9  212                    050403.32 N    1112243.47 E   1.050        1913
ABC-9  212                    050403.32 N    1112243.47 E   2.225        1958
ABC-9  212                    050403.32 N    1112243.47 E   3.550        2010
ABC-9  212                    050403.32 N    1112243.47 E   4.875        2039
ABC-9  212                    050403.32 N    1112243.47 E   5.350        2207
ABC-9  212                    050403.32 N    1112243.47 E   6.000        4193
::Goodbye::
```

Appendix D – Seismic reports and other associated information

Acquisition reports

Acquisition reports shall contain all information that may be useful for later use of the data.

Source:

- Number of source arrays, their total volume and pressure, source array separation
- Source depth (nominal) and, if measured depths are recorded, please annotate the byte position reference.
- Shooting direction with an accuracy of 3 decimals (with reference to 0 degrees north)
- Shot point interval
- Information to identify the different sources (port/stbd). For example: guncode in which byte? Or nominal firing convention (stbd fires on odd…)

Streamer:

- Number of streamers and the nominal distance between them
- Length of the streamer, the total number of recording stations and the interval between the stations
- If the single stations are grouped, the group length and interval should be listed
- Streamer depth (nominal) and if measured depths are recorded, please annotate the byte position reference
- The nominal inline offset: the distance between centre of sources and centre of the receiver stations closest to the source
- Nominal distance between CMP lines
- Streamer and group numbering convention: diagram/text explaining channel numbers from near to far trace for the different cables

Recording parameters:

- Which recording system
- Maximum recording length and sampling rate
- Recording filter (high cut and low cut with corresponding slopes), for OBS there should be specifications for both hydrophone and geophone recordings
- Recording delay (if any)
- Nominal acquisition bin size (inline/crossline distance) and nominal coverage/fold

Navigation reports

Navigation reports shall contain all information that may be useful for later use of the data.

Processing reports

shall include the following as minimum requirements:

- processing system
- processing sequence
- personnel involved both from processing company and operator
- input data
- final products, and where it is sent

Far field signature information (for OBC, signatures should be provided for both hydrophone and geophone):

Array configuration:

- Diagram to show the volumes of the single arrays and the distance between them

Modelled far field signature with source ghost:

- ASCII listing (at 2 ms sampling)
- SEG-Y (optional)
- Figure of the far field signature time series (ppt/gif/jpg/bitmap or similar)
- Figure of the far field signature amplitude spectrum signature (ppt/gif/jpg/bitmap or similar)

Modelled far field signature without source ghost:

- ASCII listing (at 2 ms sampling)
- SEG-Y
- Figure of the far field signature time series (ppt/gif/jpg/bitmap or similar)
- Figure of the far field signature amplitude spectrum (ppt/gif/jpg/bitmap or similar)

Recording filters should be applied in the modelled signatures

The full system response filter should include the effect of connecting the hydrophones to the modules in addition to the recording system filter setting. Therefore, the resulting signature includes all phase effects arising from streamer electronics.

If the far field signature is recorded, indicate the auxillary trace where this information is found.

Appendix E – Tables

Table S-1 Structure and filenames of data to be submitted for storage in the Diskos NDR

Link to table S-1 in Excel

Screen dump of a part of the table S-1:

Table_S-1_Reporting requirements for digital geophysical data

Version 6.0_Final_15092018

Legend	Explanation
	Survey type
	Folder, for structuring of data
	Mandatory dataset
	Optional dataset according to Yellow Book
	Mandatory if exemptions for reporting field and pre-stack data has been given
	Mandatory dataset, not defined explicitly in Yellow Book or needed to meet functional requirements
	Dataset not valid for/not/not yet defined to be reported for given survey type.

Survey type id	Dataset nr	Dataset ID	Dataset name 1st level	Dataset name 2nd level
5			*Seismic*	
5.1			***Conventional seismic survey***	
5.1	1.1	5.1.1.1	Entitlements and metadata information	Entitlements and metadata for survey and datasets
5.1	**2**	**5.1.2**	***Field data***	
5.1	2.1	5.1.2.1	Field data	Trace data
5.1	2.98	5.1.2.98	Field data	Metadata Table_S-2
5.1	2.99	5.1.2.99	Field data	Significant data relevant to other parties
5.1	**3**	**5.1.3**	***Pre-stack data***	
5.1	3.1	5.1.3.1	Pre-stack data Non regularized	Nav-seis merge
5.1	3.2	5.1.3.2	Pre-stack data grid regularized	Pre Mig Gathers
5.1	3.3	5.1.3.3	Pre-stack data grid regularized	Post Mig Gathers

Appendix F – Minimum metadata attributes to be supplied and mandatory code list for these

On acquisition survey level:
In addition to the Acquisition Survey name and the NPDID the following attributes should be among the Trango and Whereoil attributes. These attributes are legal/regulatory and set by the NPD:

Survey year
Survey type
Dimension (Survey Sub-Type)
Survey Kind (regulatory)
Market available (regulatory)
Area
Survey length or area

From 1.1.2015 each new dataset loaded into Diskos by CGG must be related to a survey. The relevant survey must be populated by values from the following "**code lists**" (legal values). (this will be part of "Yellow Book)

Survey type (Fact Page = Main type)
- Conventional (seismic surveys)
- OBS (Ocean Bottom Seismic surveys)
- Site survey
- Soil survey (seismic)
- Grav/Mag (survey)
- Gravimetric (survey)
- Magnetic (survey)
- Electromagnetic (survey)
- Acoustic (survey)
- Others
- 4C

Dimension (Fact Page = Sub-type)
- 2D
- 3D
- 4D
- (incl.LOFS)

Survey Kind (regulatory)
- NPD Survey
- Scientific (survey)
- Petroleum (survey)

Market available
- Yes
- No

This information will determine how the ownership and confidentiality of the datasets that relates to each survey must be managed. The information is available on NPD factpages, and are updated as soon as the acquisition survey have been approved by NPD (before acquisition starts). Data provider should submit this information to CGG when data is to be loaded.

On Dataset level (Processing Project level):

In addition to the Processing Project name the following attributes should be among the Trango and Whereoil attributes for the datasets. These are just the minimum of attributes requested and can/should be extended.

From 1.1.2015 each new dataset loaded into Diskos by CGG must be related to a Processing Project and Survey. The relevant processing project must be populated by values from the following "**code lists**" (legal values).

Project type*

- Acquisition
- Original processing
- Reprocessing
- Merge
- Other

*These may be split in two or more tables with respective codelists in PPDM data model.

Processing Project Dimension

- 2D
- 3D
- 4D

Metadata shall also include information on "Dataset Group", "Processing (type)", "Dataset type", "Attribute", "Offset", Wave Mode","Time/Depth" and "Phase".

How to submit metadata to the Diskos Operator (CGG) is covered by Appendix H

Appendix G – Form to be used when submitting data and metadata attributes

Table S - 2 Metadata to be submitted for seismic field and prestack data that will not be loaded

When applying for exemption from reporting requirements for field data , the following form is to be enclosed in the application to NPD for reporting all relevant metadata. The form must be a separate file for each survey, and in pdf-format zoomed into one page only.

Link to form S-2 in excel

Screen dump of part of the form S-2

Tecnical information field data

Field data storage medium		Field data format	
Storage location		Anticipated delivery time	
Maintainence plan		Year of last remastering/copying to new media	

Tecnical information prestack data

Storage medium		Format	
Navigation in header (Y/N)		Storage location	
Prestack versions		Anicipated delivery time	
Maintainence plan		Year of last remastering/copying to new media	

Table S – 3 Metadata to follow data submittals to Diskos Operator (CGG)

Diskos Media delivery form (DMDF). This is also to be used when submitting data on FTP.

Link to the Diskos Media Delivery Form (DMDF) and the DMDF Guide

Screen dump of part of the DMDF: