UKOOA DATA EXCHANGE FORMAT

P7/2000

FORMAT FOR WELL DEVIATION DATA

ISSUE 1, REVISION 5

OCTOBER 2002

PUBLISHED BY UK OFFSHORE OPERATORS ASSOCIATION

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SUMMARY

The data exchange format for well deviation data (P7/2000) is recommended by UKOOA for general use in the Oil and Gas, Exploration and Production industry and sets out what is generally regarded in the industry as good practice. The format is not mandatory, but strongly recommended so that the oil & gas industry can adopt a common standard.

The draft for this format was developed by a working group reporting to the Common Data Access (CDA) Well Data Advisory Group. Following discussions and feedback from a wide range of interested parties in the oil & gas industry, both in the UK and Overseas, versions Rev 1, Rev 2 and Rev 3 were prepared by a working group established by the UKOOA Surveying and Positioning Committee. Two industry-focused workshops were organised by UKOOA and CDA and feedback from these and overseas groups in the USA and Canada were incorporated into Rev 4. Revision 5 included further comments from industry, format version records, adoption of ISO terminology and the inclusion of a "proprietary" data record type.

It is recognised that the Industry is moving towards introduction of machine-readable extensible formats. This format version has deliberately not adopted this approach in an attempt to establish the format for general use. It is anticipated that future versions/revisions will reflect these improvements.

Any comments and suggestions for improvement are welcome and should be addressed to:

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Revision	***Date***	***Modification***
Rev 1	Mar 2000	- First Version Issued
Rev 2	Jun 2000	- Comments Incorporated
Rev 2.1	Feb 2001	- Phillips Comments partially incorporated
Rev 3	May 2001	- Major review
Rev 4	Dec 2001	- Incorporating recommendations from CDA workshops, Canada and USA
Rev 5	Sept 2002	- Incorporating further industry input, versioning and "proprietary" data record provision.

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1. INTRODUCTION

The P7/2000 format will allow for the exchange of raw and processed well deviation data from single or multiple surveys.

The format has been kept as simple as possible whilst being sufficiently detailed to fully define the wellpath trajectory in 3 dimensional space.

The format will only allow for data to be submitted in Azimuth degrees and not in options such as Quadrant, Quadrant Decimal or Degs Mins.

The format differs from previous P-formats in departing from the 80 character record length. This was thought necessary to ensure adequate richness of the data records.

The format has been designed to cope with survey data from any tool type, including planned data.

The format has been designed to cope with most international and local Co-ordinate Reference Systems, including local angular and unit variations as well as different Prime Meridians.

The format has also been designed to include "proprietary" data records to allow company specific data flagging and inclusion - e.g. for internal quality control/editing purposes.

2. MEDIA SPECIFICATION

2.1 Disk/CD

Format	:	MS-DOS IBM PC Compatible
Mode	:	Coded ASCII
Record Length	:	130 bytes maximum with CR/LF after character 130.

Other media such as e-mail are acceptable by prior arrangement between the interested parties. The filename should be the well name e.g. 207/29- 6 would have a file name 207B29W6.dev. If side tracked this would be 207B29W6Z.dev

2.2 Disk Labelling

Each disk should be adequately labelled so that its format and content can be readily ascertained. This labelling shall include, as a minimum: -

UKOOA Exchange Format: i.e. P7/2000 version 1.5
Current Well Number: e.g. 207/29- 6
Previous Well Number(s):
Date(s) Survey Acquired: e.g. 15-28/2/2000
Contractor: If available

Variations in the above specification may be allowed but only with the express agreement of all parties involved in the data exchange. Any variation or uncertainty should be fully explained through full and detailed use of the H0700 free-form Remark records.

Each well shall form a logical file which shall consist of a complete set of "Header Records" followed by "Data Records".

3. DEVIATED WELL TERMINOLOGY

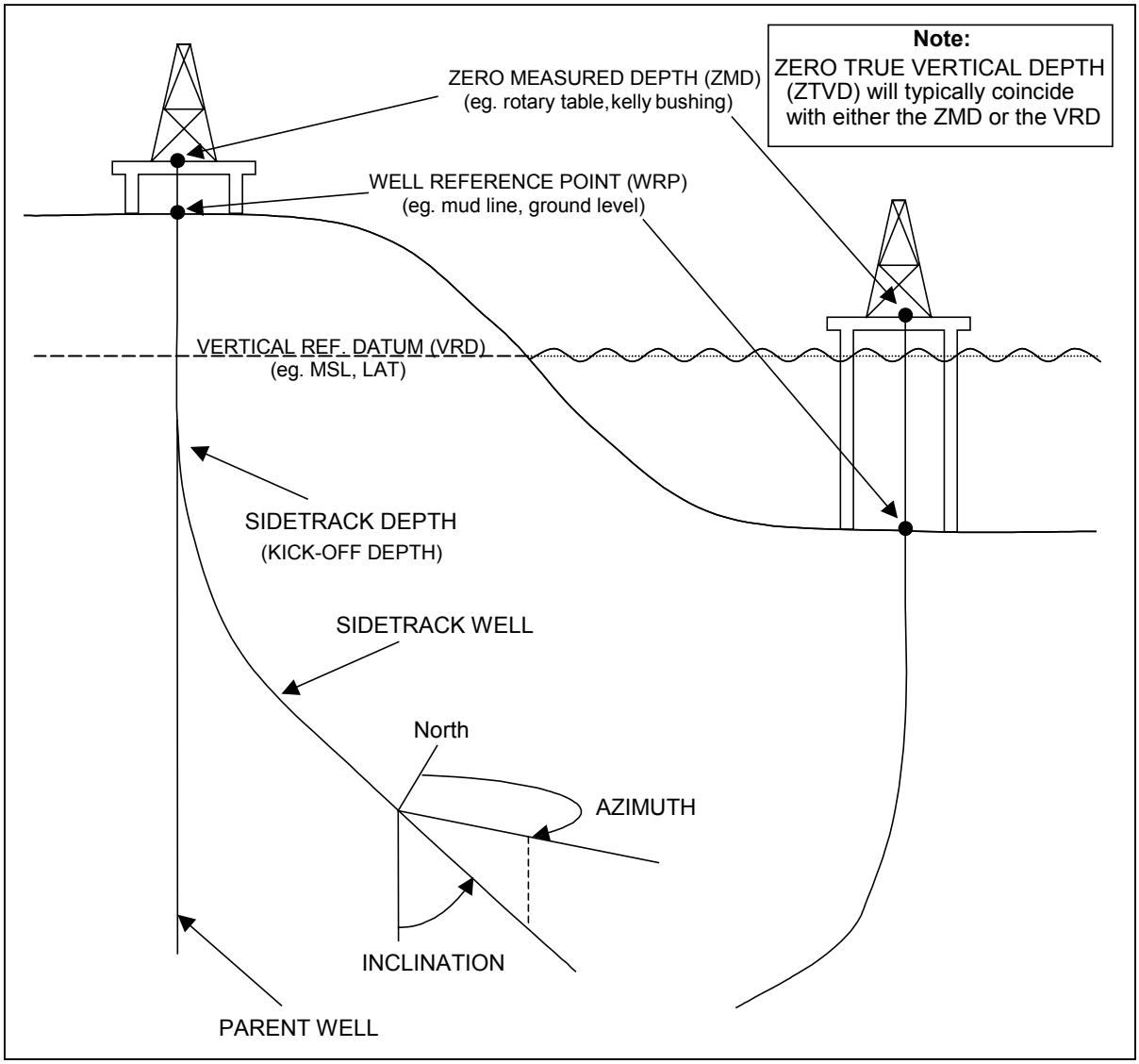

Fig. 1 Deviated Well Terminology

3.1 Depth References

Drillers reference along-hole depth (invariably referred to as *measured depth, MD*) to a level at or just above the level of the drill floor (RT=rotary table, KB= kelly bushing). In this document, this reference level is referred to as *zero measured depth (ZMD*). ZMD is rig-dependent, so may be different between a parent well and its sidetracks. In addition to ZMD, some Operators define a permanent reference point further down the well, called the *well reference point (WRP)*. The WRP is typically at or close to ground level (land rigs) or sea bed (offshore rigs). The absolute elevation of a well in space is determined from the elevation of ZMD and/or the WRP with respect to the *vertical reference datum (VRD*). VRD is typically Mean Sea Level (MSL), but may be Lowest Astronomical Tide (LAT) or a land survey datum.

For calculated data, the vertical depth reference is called *zero true vertical depth (ZTVD)*. This may coincide with ZMD (the usual practice of drillers), with MSL (geoscientists) or may have a separate definition.

3.2 Azimuth Reference Directions

When originally acquired, deviation survey azimuths are referenced to Magnetic North (magnetic surveys) or True North (north-seeking gyro surveys). Conventional gyro surveys are referenced to a surface reference object (RO).

As part of the data processing, azimuths are converted to a common reference direction, invariably True North or Grid North. This common reference direction will typically apply to all an Operator's wells in a field, country or region.

Conversion of azimuths to the common reference direction requires knowledge of the *magnetic declination* (the true bearing of Magnetic North) and/or the *grid convergence* (the true bearing of Grid North). Magnetic declination varies in both space and time, grid convergence varies in space, but is constant in time. Both magnetic declination and grid convergence can be either positive or negative, so it is advisable to check the correction to the common azimuth reference direction with the help of a diagram. The convention applied shall be +ve = clockwise. Two examples are shown below:

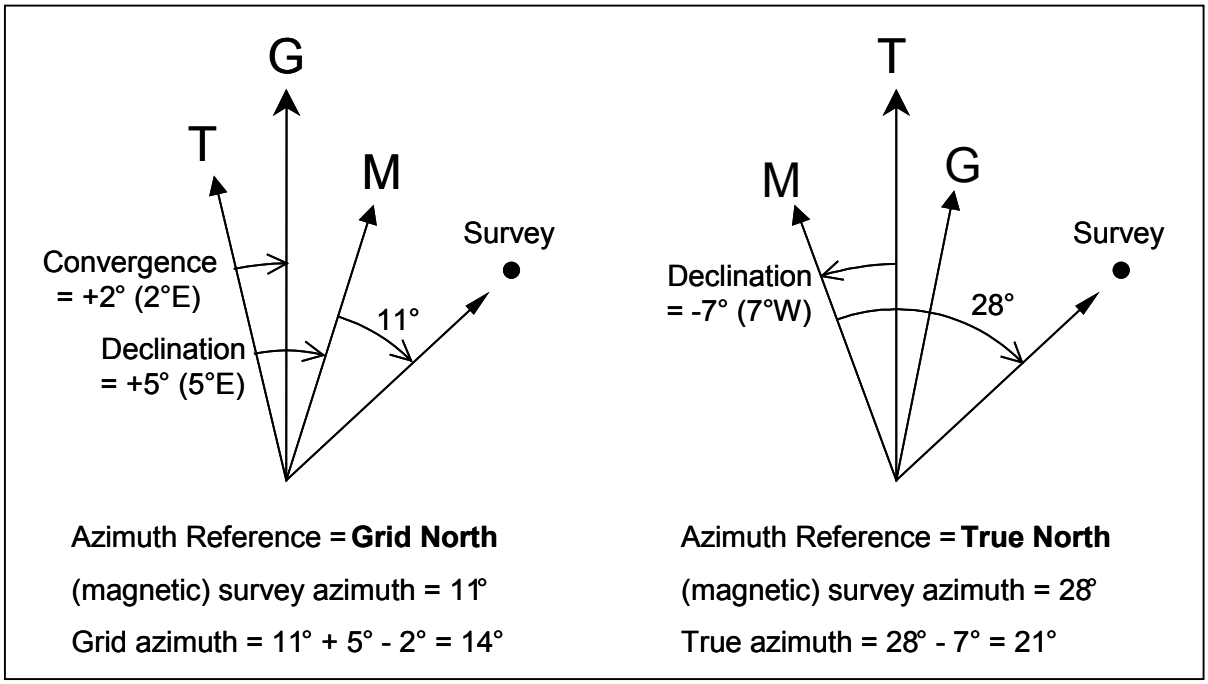

Fig. 2 Two Examples of Azimuth Reference Correction

N.B. It should be noted that if the projected co-ordinate reference system of the well is changed, then any associated Grid Azimuth or X/Y offset data will also change. This is because the magnitude (and possibly the direction) of the convergence angles described above are dependent on the projected co-ordinate reference system (ProjCRS).

3.3 Geodetic Co-ordinate Reference System Description

The co-ordinate reference system (CRS) used to define the surface location of a well may be defined:

a) using European Petroleum Survey Group (EPSG) codes (header records H8000 to H8006)

b) by explicit definition of co-ordinate reference system parameters (header records H0200 to H0232)

c) by both (a) and (b) together.

3.3.1 H8000 to H8006: EPSG Co-ordinate Reference System Description

For improved machine readability and/or to enable integrity checking of co-ordinate system definitions, a set of EPSG records has been adopted for all UKOOA Positioning (P) formats. This allows an industry-standard name to be quoted where the geodetic co-ordinate reference system used for the survey is a common system. Records H8000 and H8001 describe a Geographic Co-ordinate Reference System (GeogCRS), **and are mandatory**; records H8002 and H8003 describe a Projected Co-ordinate Reference System (ProjCRS); records H8004 and H8005 describe a Vertical Co-ordinate Reference System (VertCRS) and the H8006 record gives the EPSG database version number. Defining parameters and units are then as given by EPSG and are not required to be given in the H02XX records. They may, however, be provided as an integrity check.

A full description of the EPSG codes and rules for defining a co-ordinate reference system can be found at the following web address: http://www.epsg.org.

3.3.2 H0200 to H0232: Generic Co-ordinate Reference System Description

As an alternative to the above EPSG Co-ordinate Reference System definition records, or if the co-ordinate reference system in question is not listed within the EPSG database, the H02XX series of header records can be used to define the relevant co-ordinate reference system.

Depending on the location in the world the defining parameters of various projection methods differ. Only the relevant parameters need to be completed for records H0200 to H0232.

Projection	**Defining Parameters to be included in header (See below)**
U.T.M.	H0211, 214
Transverse Mercator	H0214, 216, 218, 219
Lambert Conic (1 SP)	H0214, 218, 219
Lambert Conic (2 SP)	H0212, 214, 216, 218
Mercator (2 SP)	H0212, 214, 216, 218
Cassini-Soldner	H0216, 218
Oblique Mercator	H0216, 218, 219, one of 222 through 226
Stereographic	H0216, 218, 219
New Zealand Map Grid	H0216, 218

Type	**Item**	**Format**
H0200	Geodetic Datum Name	A12
H0201	Ellipsoid-Axis-Inv Flat	A20, F12.3, F12.7
H0202	Transformation parameters	3(F6.1), 3(F6.3), F10.7
H0210	Projection Method	A4, 2X, A42
H0211	Projection Zone Name (Incl Hemisphere for UTM)	A47
H0212	Lat of Std Parallels (dms N/S)	2(1X, I3, I2, F6.3, A1, 1X)
H0213	Lat of Std Parallels (grad N/S)	2(F11.7, A1, 1X)
H0214	Lon of CM (dms E/W)	1X, I3, I2, F6.3, A1
H0215	Lon of CM (grads E/W)	F11.7, A1
H0216	Map Grid Origin (dms N/E)	2(1X, I3, I2, F6.3, A1, 1X)
H0217	Map Grid Origin (grad N/E)	2(F11.7, A1, 1X)
H0218	Map Grid Origin (E, N)	2(F12.2, A1, 1X)
H0219	Map Grid Scale Factor	F12.10
H0220	Lat/Lon of Scale Origin (dms N/S/E/W)	2(1X, I3, I2, F6.3, A1, 1X)
H0221	Lat/Lon of Scale Origin (grad N/S/E/W)	2(F11.7, A1, 1X)
H0222	Lat/Lon of Initial Projection Line (dms)	2(1X, I3, I2, F6.3, A1, 1X)
H0223	Lat/Lon of Initial Projection Line (grad)	2(F11.7, A1, 1X)
H0224	Bearing of Initial Projection Line (dms)	1X, I3, I2, F6.3, A1
H0225	Bearing of Initial Projection Line (grad)	F11.7
H0226	Quad Bearing (N/S dms E/W)	A1, 2X, 2I2, F6.3, A1
H0227	Quad Bearing (N/S grads E/W)	A1, F11.7, A1
H0228	Skew to Rectified (dms)	I3, I2, F7.4
H0229	Long of Prime Meridian from (dms E/W)	1X, I3, I2, F6.3, A1
	- referenced to Greenwich and only to be used if PM is not Greenwich	
H0230	ProjCRS Length units and conversion to metres	I1, X2, A38, X2, F15.12
H0231	CRS angular units	I1, X2, A55
H0232	Vertical Reference Datum (VRD)	A58

3.3.3 Geodetic Datum and Spheroid information

H0202 requires datum transformation parameters between the Geodetic Datum defined in records H0200 and H201, and WGS84.

The Position Vector (Bursa-Wolfe) transformation model should be used to define these:

$$\underset{(2)}{\begin{pmatrix} X \\ Y \\ Z \end{pmatrix}} = \begin{pmatrix} DX \\ DY \\ DZ \end{pmatrix} + (SCALE) \begin{pmatrix} 1 & -RZ & +RY \\ +RZ & 1 & -RX \\ -RY & +RX & 1 \end{pmatrix} \bullet \underset{(1)}{\begin{pmatrix} X \\ Y \\ Z \end{pmatrix}}$$

where X, Y, Z are geocentric cartesian co-ordinates in metres,
DX, DY, DZ are translation parameters in metres,
RX, RY, RZ are clockwise rotations defined in arc secs, but converted to radians for use in formula,

SCALE = [1 + S. (10e-6)] where S is in parts per million.

EXAMPLE: [For checking formula only.]

FROM	Datum 1 : WGS72	TO	Datum 2 : WGS84
Semi Major Axis a	6378135.0 metres		6378137.0 metres
1/f	298.26		298.257223563
Latitude	39 13 26.5782 N		39 13 26.6976 N
Longitude	98 32 32.2870 W		98 32 31.7330 W
Spheroidal Height :	570.88 metres		573.249 metres
X	-734985.205		-734972.229
Y	-4893185.191		-4893188.272
Z	4011976.605		4011982.012
DX	0.0		
DY	0.0		
DZ	+4.5 metres		
RX	0.0		
RY	0.0		
RZ	+0.554 arc secs = 0.000002686 radians		
S	+0.2263 ppm		

Note: More header records may be required for locations in other parts of the world where projections and geodetic datums differ.

3.4 Horizontal Surface Location

The format includes two alternative means of defining the well location at surface:

a) Relative to Well Reference Point, WRP (Records H0300 – H0325). This may be used whenever the projected co-ordinates of the surface location are known, e.g. for single isolated wells.
b) Relative to Site Reference Point, SRP (Records H0330 – H0370). When the well is drilled from a slot on a fixed platform, its location may only be known as an offset from a known point (the SRP), such as the platform centre.

Use of either method (a) or method (b) or both, is acceptable.

3.5 Calculated Data

A "calculated" survey is one for which position information (vertical, north, east) is presented in addition to measurement information (depth, inclination, azimuth). The format allows two types of calculated data to be presented:

a) Offset data. North and east co-ordinates measured relative to a known point (e.g. WRP or SRP). Length unit must be the same as H0150. North direction must be the same as H0500. Vertical co-ordinate relative to ZTVD.
b) Projected data. North and east projected co-ordinates. Vertical co-ordinate relative to VRD.

Inclusion of calculated data is optional. If it is included, either type (a), or type (b) or both is acceptable.

3.6 H0700: Remarks

Header record type H0700 is a free format statement of any other relevant information such as well name aliases, tool descriptions or position uncertainty notes. H0700 records may be repeated as often as required and extensive use of this record type is encouraged.

It could be used to record details of the software used to develop the file i.e. Compass 2000.0 B11.

4. HEADER RECORD SPECIFICATION & DEFINING PARAMETERS

The TYPE covers column 1-5, the ITEM description columns 7-41, and all FORMAT statements begin in column 43 and end in column 130.

Format description is given in Fortran style (i.e. F-float, A-character, I-integer, and X-space).
Example: 2 (A4, 2X, F6.3, X) = '`ABCD  00.000 ABCD  00.000 `'

Formats of parameter data fields for each of the header record types are as follows:

N.B. For the UKOOA format identification Name and version (H0001 record), the descriptor is Pxx_yyyyvxx.xx with an A20 field. However the "v" always falls in the 15th character and there should be no leading zeros.

Type	Item	Format	Description
Format Identification Records			
H0001	Format Name and Version:	A20	UKOOA P 7_v2000 1.01
H0002	Format Type:	I1	ASCII Card Image = 1, XML = 2
Well Identification Records (*including well alias fields*)			
H0100	Country:	A3	This will be the three character ISO code e.g. GBR (United Kingdom), NOR (Norway), NLD (Netherlands), USA (United States).
H0110	Well Name:	A58	Within the UKCS this will be the DTI PON12 registration number of the well or CDA/DTI standard e.g. 207/29- 6.
H0120	Development/Field Name:	A58	
H0130	UWI:	A58	The unique well identifier (necessary if format is to be usable outside UKCS).
H0140	UWI Agency:	A58	E.g. DTI, API, NPD, HIS
H0150	Depth Units:	A1	Linear measurement units for measured and true vertical depths. M=(International) metres, F = (International) feet.
H0160	Sidetrack (ST)?:	A1	Y or N
H0170	Parent Well Name:	A58	If H0160="Y": Using the same Well Name convention as H0110.
H0180	Sidetrack Depth (MD) below WRP:	F8.2	If H0160="Y": Measured depth of Sidetrack kick-off below Well Reference Point
H0190	Slot Number or Name:	A4	For multi-well developments
H019X	Well Alias & Owner:	A20, A38	Will allow multiple (9max) Well alias names and their sources/owners to be identified.
Co-ordinate Reference System Records - EPSG *(for EPSG name and code listing try http//:www.epsg.org)*			
H8000	EPSG GeogCRS Name:	A58	EPSG name listing found at http//:www.epsg.org
H8001	EPSG GeogCRS Code:	I5	EPSG code listing found at http//:www.epsg.org
H8002	EPSG ProjCRS Name:	A58	EPSG name listing found at http//:www.epsg.org
H8003	EPSG ProjCRS Code:	I5	EPSG code listing found at http//:www.epsg.org
H8004	EPSG VertCRS Name(VRD):	A58	= Vertical Reference Datum
H8005	EPSG VertCRS Code:	I5	EPSG code listing found at http//:www.epsg.org
H8006	EPSG Database Version:	F4.1	

Type	Item	Format	Description
Co-ordinate System Records - Generic Description (*see section 3.3.2 for list of variants*)			
H0200	Geodetic Datum Name:	A58	Name of the Geodetic Datum used by the Geographical Co-ordinate Reference System. E.g. WGS84 or ED50. See also H8000 series cards for EPSG GeogCRS description.
H0201	Ellipsoid name, a, 1/f:	A20, X2, F12.3, X2, F12.7	Description of the Reference Ellipsoid used by the Geographical Co-ordinate Reference System. Name, semi major axis & inverse flattening E.g. WGS84, 6378135.000, 298.2572236. See also H8000 series cards for EPSG GeogCRS description
H0202	Datum Transformation Parameters:	3(F6.1), 3(F6.3), F10.7	Datum transformation parameters should follow the Position Vector (Bursa Wolfe) model: dx, dy, dz, rx, ry, rz, s. See description above for more info.
H0210	Projection Method:	I3, X2, A53	The following projection codes and names have been defined: (See also H8000 series cards for EPSG ProjCRS description) 001 U.T.M. Northern Hemisphere 002 U.T.M. Southern Hemisphere 003 Transverse Mercator (North Oriented) 004 Transverse Mercator (South Oriented) 005 Lambert Conic Conformal, (one standard parallel) 006 Lambert Conic Conformal, (two standard parallels) 007 Mercator (2 SP) 008 Cassini-Soldner 009 Oblique Mercator (Skew Orthomorphic) 010 Stereographic 011 New Zealand Map Grid 999 Any other projection or non-standard variation of the above.
H0211	Projection Zone Name:	A58	If applicable. e.g. Zone 31 Northern Hemisphere.
H0214	Longitude of CM:	I3, I2, F6.3, A1	Longitude of central meridian e.g. 3 degrees east is input as 0030000.000E
H0230	ProjCRS length units, conversion to m:	I1, X2, A38, X2 F15.12	The code and description of map grid co-ordinate ref system linear units is defined as: Linear unit code 1 for International metres, 2 for any other unit.
H0231	CRS angular units:	I1, X2, A55	The code and description of CRS angular units is defined as: Angular unit code is 1 for sexagesimal degrees, 2 for any other unit. E.g. 123 deg 4 min 53.124E sec is input as 1230453.124E.
H0232	Vertical Reference Datum (VRD):	A58	Description of Field Datum level e.g. Mean Sea Level, Lowest Astronomical Tide or Geoid model.

Well Surface Location Records – From Well Reference Point			
H0300	Well Reference Point (WRP):	A58	Description of permanent retraceable point in the well – e.g. Mud Line, Ground Level, Casing Head Flange, Rotary Table
H0310	Projected N Co-ordinate of WRP:	F12.2, A1	Y-co-ordinate e.g. 5836723.00N
H0315	Projected E Co-ordinate of WRP:	F12.2, A1	X-co-ordinate e.g. 456781.00E
H0320	Latitude of WRP:	I3, I2, F6.3, A1	E.g. 052 deg 24 min 43.376 sec North is input as 522443.376N .
H0325	Longitude of WRP:	I3, I2, F6.3, A1	E.g. 022 deg 13 min 08.638 sec East is input as 0221308.638E

Type	Item	Format	Description
Well Surface Location Records – From Site Reference Point			
H0330	Site Reference Point (SRP):	A58	Description of permanent retraceable point on site – e.g. Platform centre, Slot Name, Survey monument
H0340	Projected N Co-ordinate of SRP:	F12.2, A1	Y-co-ordinate e.g. 5836723.00N
H0345	Projected E Co-ordinate of SRP:	F12.2, A1	X-co-ordinate e.g. 456781.00E
H0350	North offset of WRP from SRP:	F7.2	North = + ve, South = -ve, North reference as H0365, H0370
H0355	East offset of WRP from SRP:	F7.2	East = + ve, West = -ve, North reference as H0365, H0370
H0360	Offset distance units:	A1	M=(International) metres, F = (International) feet.
H0365	Offset north reference:	A12	TRUE, GRID or PLATFORM
H0370	Platform North:	F6.2	If H0365=”PLATFORM”; Degrees clockwise from True North
Vertical Location Records (*VRD as defined in co-ordinate system records H8004 or H0232 above*)			
H0380	Water Depth relative to VRD:	F8.2	If offshore well: Units per H0150
H0385	Elevation of Zero MD rel. to VRD:	F8.2	Positive figure if above, negative if below, units per H0150
H0390	Elevation of WRP rel. to VRD:	F8.2	Positive figure if above, negative if below, units per H0150
H0395	Measured Depth of WRP:	F8.2	
H0396	True Vertical Depth of WRP:	F8.2	To be completed if different to H0395 (i.e. WRP at the seabed and curved conductors are employed).
Data Provenance Records			
H0400	Well Operator (acquisition):	A58	Name of well operator which originally acquired the survey
H0410	Survey company (acquisition):	A58	Name of contractor which originally acquired the survey, depth range
H0420	Date acquired:	I4, 2(I2)	Date in YYYYMMDD form e.g. 15th April 1994 is 19940415.
H041X	Survey company (acquisition):	A58	For multiple surveys extra header records should be added with contractor and depth range.
H042X	Date acquired:	I4, 2(I2)	
H0430	Well Operator (processing):	A58	Name of operator which most recently processed the survey
H0440	Survey company (processing):	A58	Name of contractor that most recently processed the survey.
H0450	Date Processed/Issued:	I4, 2(I2)	(Date in YYYYMMDD form).
Azimuth Reference Records			
H0500	Azimuth Reference:	A16	“UNKNOWN”, “MAGNETIC”, “GRID”, “TRUE” or “INCLINATION ONLY”
H0510	Magnetic Declination applied:	F6.3	If a magnetic tool was used include the magnetic declination used e.g. 3.42 degrees West = -3.42.
H0520	Grid Convergence applied:	F6.3	If H0500=“GRID”: Grid convergence from True North, degrees.

Type	Item	Format	Description
Survey Calculation Records (*calculated data only*)			
H0600	Survey calculation method:	A58	If the data is calculated: e.g. Tangential, balanced tangential, average angle, radius of curvature, minimum curvature.
H0610	Elevation of Zero TVD (ZTVD):	F8.2	Elevation of zero TVD above Vertical Reference Datum
H0620	Offset co-ordinate origin	A5	"WRP", "SRP" or "OTHER" (defined below)
H0630	Projected N co-ord. of offset origin:	F12.2, A1	If H0630="OTHER": Y-co-ordinate e.g. 5836723.00N
H0635	Projected E co-ord. of offset origin:	F12.2, A1	X-co-ordinate e.g. 456781.00E
Remark Records			
H0700	Remarks	A58	Free form notes to capture information.

5. DATA RECORD SPECIFICATION & DEFINING PARAMETERS

The data records and their defining parametres begin in character position 1 and end in character position 130.

Format description is given in Fortran style (i.e. F-float, A-character, I-integer, and X-space).
Example: 2 (A4, 2X, F6.3, X) = '`ABCD  00.000 ABCD  00.000 `'

Formats of parameter data fields for each of the data record types are as follows:

Data Records				
The data will be presented in up to 14 columns. If the data is uncalculated, columns 1-6 only will be populated. If the data is calculated columns 7-9 and/or columns 10-14 will be populated.				
Column	**Item**	**Character No.**	**Format**	**Data Description**
1	Data Section Identifier	1	A1	(D) In order to recognise data records
2	Measured Depth	3-10	F8.2	Along hole in units as H0150, increasing along the well so points are in order, +ve below ZMD
3	Inclination	12-18	F7.3	In decimal degrees, 0 degrees is vertically downwards and 90 degrees is horizontal. E.g. 113.420
4	Azimuth	20-26	F7.3	In decimal degrees relative to azimuth reference (H0500) e.g. 230.700
5	Survey Tool Type	28-30	I3	Choose from 1. Inclination Only 2. Magnetic (Film based single shot or multishot) 3. Electronic Magnetic Single Shot or multishot 4. Dipmeter or other FE wireline log 5. MWD or steering tool 6. Conventional Gyro 7. North Seeking Gyro 8. Inertial 9. Unknown Note: further codes may be defined in future.
6	Station Type	32	A1	S=survey, P=planned, O=other
7	TVD below ZTVD	34-41	F8.2	Reference from H0610, units from H0150
8	North offset co-ordinate	43-52	F9.2, A1	Reference direction from H0500, Origin from H0630, units from H0150, e.g. 24567.00N
9	East offset co-ordinate	54-63	F9.2, A1	Reference direction from H0500, Origin from H0635, units from H0150, e.g. 12345.00E
10	TVD below VRD	65-72	F8.2	Units from H0150
11	Projected North co-ordinate	74-86	F12.2, A1	e.g. 2456781.00N
12	Projected East co-ordinate	88-100	F12.2, A1	e.g. 456781.00E
13	Data point Latitude (ddmmss.sss N/S)	101-115	X4, I2, I2, F6.3, A1	e.g. 221256.103N
14	Data point Longitude (dddmmss.sss N/S)	116-130	X3, I3, I2, F6.3, A1	e.g. 0023450.445E

5.1 Proprietary Data Record Specification and Defining Parameters

To allow flexibility with the data records a proprietary data record is included. This facility will allow users to include additional data for use within their own data systems while still conforming to the standard. If a proprietary record is encountered within the data set it can be identified and ignored by other users.

Proprietary Data Records				
Column	**Item**	**Character No.**	**Format**	**Data Description**
1	Data Section Identifier	1	A1	(P) In order to recognise a proprietary data record
2	Length of Data String	3-6	I4	Number of subsequent characters comprising the proprietary record.
3	Proprietary Data	8- 130		Free Format of data.

APPENDIX A EXAMPLES

Three examples are included. The first contains a minimum of header records; the second, also a minimum example, include use of proprietary data records, and the third example is more comprehensive. All are acceptable uses of this format.

A.1 Minimal Example

```
0000000001111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111111122222222223
1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

H0100 Country:                          USA
H0110 Well Name:                        16-02
H0150 Depth Units:                      F
H0160 Sidetrack (ST)?:                  N
H8002 EPSG Projected CRS Name:          NAD27 / Alaska zone 4
H8003 EPSG Projected CRS Code:          26734
H8004 EPSG Vertical CRS Name (VRD):     Mean Sea Level
H8005 EPSG Vertical CRS Code:           5100
H8006 EPSG Database Version:            4.4
H0300 Well Reference Point (WRP):       Kelly Bushing
H0310 Projected N Coord of WRP:           6078048.39N
H0315 Projected E Coord of WRP:            565469.19E
H0320 Latitude of WRP:                   703725.247N
H0325 Longitude of WRP:                 1492740.557W
H0385 Elevation of Zero MD rel. to VRD:     61.40
H0390 Elevation of WRP relative to VRD:     61.40
H0395 Measured Depth of WRP:                 0.00
H0500 Azimuth Reference:                TRUE
D     0.00   0.000   0.000   9 O
D    32.20   0.000   0.000   9 O
D  1000.00   0.000   0.000   9 O
D  1059.00   1.100 121.500   8 S
D  1161.00   3.600 115.500   8 S
D  1290.00   5.900 123.600   8 S
D  1346.00   5.800 126.900   8 S
D  1453.00   4.300 134.300   8 S
D  1547.00   4.000 142.900   8 S
D  1639.00   3.600 140.880   8 S
D  1731.00   3.300 141.100   8 S
D  1824.00   3.200 131.300   8 S
D  1915.00   2.800 139.200   7 S
D  2070.00   2.700 128.500   7 S
D  2108.00   2.400 130.600   7 S
D  2200.00   2.400 130.600   9 O

0000000001111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111111122222222220
1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
```

A.2 Minimal Example (Including Proprietary Data)

```
0000000001111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111111122222222223
1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

H0100 Country:                          USA
H0110 Well Name:                        16-02
H0150 Depth Units:                      F
H0160 Sidetrack (ST)?:                  N
H8002 EPSG Projected CRS Name:          NAD27 / Alaska zone 4
H8003 EPSG Projected CRS Code:          26734
H8004 EPSG Vertical CRS Name (VRD):     Mean Sea Level
H8005 EPSG Vertical CRS Code:           5100
H8006 EPSG Database Version:            4.4
H0300 Well Reference Point (WRP):       Kelly Bushing
H0310 Projected N Coord of WRP:           6078048.39N
H0315 Projected E Coord of WRP:            565469.19E
H0320 Latitude of WRP:                   703725.247N
H0325 Longitude of WRP:                 1492740.557W
H0385 Elevation of Zero MD rel. to VRD:     61.40
H0390 Elevation of WRP relative to VRD:     61.40
H0395 Measured Depth of WRP:                 0.00
H0500 Azimuth Reference:                TRUE
D     0.00   0.000   0.000   9 O
P 0012 123456789012
D    32.20   0.000   0.000   9 O
D  1000.00   0.000   0.000   9 O
D  1059.00   1.100 121.500   8 S
D  1161.00   3.600 115.500   8 S
P.00252AjkRecord Ignored121002
D  1290.00   5.900 123.600   8 S
D  1346.00   5.800 126.900   8 S
D  1453.00   4.300 134.300   8 S
D  1547.00   4.000 142.900   8 S
D  1639.00   3.600 140.880   8 S
D  1731.00   3.300 141.100   8 S
P 0005 B1255
P 0108 C223889912322 Any comment that has been included with the particular data record. Also additional data flags
D  1824.00   3.200 131.300   8 S
D  1915.00   2.800 139.200   7 S
D  2070.00   2.700 128.500   7 S
D  2108.00   2.400 130.600   7 S
D  2200.00   2.400 130.600   9 O

0000000001111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111111122222222220
1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
```

A.3 Comprehensive Example

```
00000000011111111112222222222333333333344444444445555555556666666666777777777788888888899999999990000000000111111111122222222223
12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

H0100 Country:                            GBR
H0110 Well Name:                          207/29-A6Z
H0120 Development/Field Name:             Saltire
H0130 UWI:                                207/29-A6Z
H0140 UWI Agency:                         DTI
H0150 Depth Units:                        F
H0160 Sidetrack (ST)?:                    Y
H0170 Parent Well Name:                   207/29-A6
H0180 Sidetrack Depth (MD) below WRP:     1726.4
H0190 Slot Number or Name:                C1
H8002 EPSG Projected CRS Name:            ED50 / UTM zone 31N
H8003 EPSG Projected CRS Code:            23031
H8004 EPSG Vertical CRS Code:             5100
H8005 EPSG Vertical CRS Name:             Mean Sea Level
H8006 EPSG Database Version:              4.4
H0200 Geodetic Datum Name:                ED50
H0201 Ellipsoid - Axis-Inv Flat:          International 1924   6378388.000 297.0
H0202 Transformation Parameters:           -89.5 -93.8 -123.1 0.000 0.000 -0.156    1.200
H0210 Projection Method                   001  Universal Transverse Mercator
H0211 Projection Zone Name:               Zone31   Northern Hemisphere
H0214 Longitude of CM (dms E/W):          0030000.000E
H0230 Projected CRS Units:                1
H0231 Geographical CRS Units:             1
H0232 Vertical Reference Datum (VRD)      Mean Sea Level
H0300 Well Reference Point (WRP):         Sea Bed
H0310 Projected N Coord of WRP:             6623785.69N
H0315 Projected E Coord of WRP:              425353.84E
H0320 Latitude of WRP:                      594437.834N
H0325 Longitude of WRP:                   0014019.131E
H0330 Site Reference Point (SRP):         Slot Bay Centre
H0340 Projected N Coord of SRP:             6623781.95N
H0345 Projected E Coord of SRP:              425366.47E
H0350 North Offset of WRP from SRP:           3.74
H0355 East Offset of WRP from SRP:          -12.63
H0360 Offset Distance Units:              M
H0365 Offset North Reference:             Grid
H0380 Water Depth relative to VRD:          118.40
H0385 Elevation of Zero MD rel. to VRD:      54.60
H0390 Elevation of WRP relative to VRD:    -118.40
H0395 Measured Depth of WRP:                173.09
H0400 Well Operator (acquisition):        Highland Oil
H0410 Survey Company (acquisition):       Tain Drilling, 0-1824
H0411 Survey Company (acquisition):       AC Surveys, 1915-3584
H0420 Date Acquired:                      19720628
H0421 Date Acquired:                      19720709
H0430 Well Operator (processing):         Lowland Exploration & Production
H0440 Survey Company (processing):        Directional Services Inc.
H0450 Date Processed/Issued:              19940415
H0500 Azimuth Reference:                  GRID
H0510 Magnetic Declination Applied:         -1.42
H0520 Grid Convergence Applied:             -1.15
H0600 Survey Calculation Method:          Minimum Curvature
H0610 Elevation of Zero TVD rel. to VRD:     56.00
H0620 Offset Co-ordinate Origin           OTHER
H0630 Projected N coord of offset origin:   6623783.95N
H0635 Projected E coord of offset origin:    425358.13E
H0700 Remarks                             Curved conductor
D   173.09   2.190   292.150 9 O   173.00      3.74N    -12.63E   117.00   6623785.69N    425353.84E    594437.834N   0014019.131E
D   200.00   2.190   292.150 7 P   209.88      4.27N    -13.94E   153.88   6623786.22N    425352.53E    594437.850N   0014019.046E
D   300.00   5.000   300.000 7 P   299.70      6.88N    -18.93E   243.70   6623788.83N    425347.55E    594437.931N   0014018.724E
D   780.77  45.210    62.970 7 P   734.32    100.45N    123.34E   678.32   6623882.37N    425489.77E    594441.046N   0014027.710E
D  4294.98  45.210    62.970 5 P  3210.00   1234.00N   2345.00E  3154.00   6625015.54N    427710.69E    594519.080N   0014248.507E
D  4380.15  45.210    62.970 5 P  3270.00   1261.47N   2398.84E  3214.00   6625043.00N    427764.51E    594520.001N   0014251.920E

00000000011111111112222222222333333333344444444445555555556666666666777777777788888888899999999990000000000111111111122222222223
12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
```