DEPARTMENT OF THE INTERIOR

MINERALS MANAGEMENT SERVICE

DIRECTIONAL SURVEY
REPORTER'S HANDBOOK

For Use in Reporting Directional Surveys for Outer Continental Shelf Wells

Revision 1 (December 10, 2002)

Foreword

This Directional Survey Reporter's Handbook is designed to aid the person submitting these reports addressed in the operating regulations 30 CFR Part 250. Requirements for submitting a copy of the directional survey report and digital survey data are detailed on the following pages.

This revision incorporates NTL 2002-G12 which supercedes NTL 99-G17. It also includes additional guidance on paper copy submittal.

Code of Federal Regulations (CFR) and Notice to Lessees (NTL)

Title 30 – Mineral Resources – Chapter II – Minerals Management Service (MMS), Department of the Interior, Part 250 – Oil and Gas and Sulphur Operations in the Outer Continental Shelf (OCS) contains regulations for OCS mineral activities. These regulations can be found online at: http://www.access.gpo.gov/nara/cfr/index.html

30 CFR 250.401(e) specifies requirements for conducting directional surveys and 30 CFR 250.416 stipulates what surveys must be kept and submitted. Notice to Lessees and Operators (NTL) 97-06, NTL 97-06 Attachment No. 1, and NTL 98-18 provide further guidance on submitting directional surveys for Gulf of Mexico Region (GOMR) OCS boreholes. NTL 2002-G12 describes requirements for datums and datum transformations for the GOMR.

What Directional Surveys must be conducted?

The regulations at 30 CFR 250.401(e) contain the following requirements for directional surveys:

- Inclinational surveys shall be obtained on all vertical wells at intervals not exceeding 1,000 feet during the normal course of drilling.

- Directional surveys giving both inclination and azimuth shall be obtained on all directional wells at intervals not exceeding 500 feet during the normal course of drilling and at intervals not exceeding 100 feet in all portions of the hole when angle-changes are planned.

- On both vertical and directionally drilled wells, directional surveys giving both inclination and azimuth shall be obtained at intervals not exceeding 500 feet prior to or upon setting surface or intermediate casing, liners, and at total depth.

- A composite dipmeter directional survey or a composite measurement-while-drilling (MWD) directional survey including a listing of the directionally computed inclinations and azimuths on a well classified as vertical will be acceptable as fulfilling the applicable requirements of this paragraph. In the event a composite MWD survey is run, a multishot survey shall be obtained at each casing point in order to confirm the MWD results.

- Wells are classified as vertical if the calculated average of inclination readings weighted by the respective interval lengths between readings from surface to drilled depth does not exceed 3 degrees from the vertical. When the calculated average inclination readings weighted by the length of the respective interval between readings from the surface to drilled depth exceeds 3 degrees, the well is classified as directional.

Who must file?

Any operator of a lease or unit on the Federal OCS who has drilled a well for the purposes of exploration for, or development of, oil or gas resources. This includes wells currently drilling, previously drilled and temporarily abandoned, or previously drilled and completed.

What information must be filed?

One digital copy and **one paper copy of the final composite** directional survey to the respective OCS Region indicated below. The digital copy should be comparable to the paper copy. Submit these survey results on IBM PC compatible 3.5" diskettes or compact discs as ASCII files. According to 30 CFR 250.401, "In calculating all surveys, a correction from true north to Universal-Transverse-Mercator-Grid-north or Lambert-Grid-north shall be made after making the magnetic-to-true-north correction." Please identify the UTM or Lambert zone. Use the specific formatting for directional data described in the **Appendix,** "Digital Exchange Format for Directional Surveys." ***Please do not submit copies of separate interim runs to the MMS; send final composites only. If the use of more than one vendor prevents the consolidation of the separate surveys within a wellbore, submit the final composite survey from each vendor.***

When must the Survey be submitted?

Directional surveys shall be submitted as soon as available, but not later than 30 days after the completion of operations, temporary or permanent abandonment takes place or suspension of operations of a specific well.

Where reports and related correspondence must be sent.

Related correspondence, inquiries, and data should be submitted to the appropriate OCS Region at the address below. In lieu of mailing, these files may be sent via email at the discretion of the operator. **Note: The MMS gateway is not encryption-protected at this time.** When digital data submission is sent by E-mail include the name, address, and telephone number of the person to contact to provide additional information.

GULF OF MEXICO OCS REGION
Technical Data Management Section (MS 5020)
Minerals Management Service
1201 Elmwood Park Boulevard
New Orleans, Louisiana 70123-2394
Phone: (504) 736-2911 or 736-2566
Fax: (504) 736-2857
Internet email: tdms@mms.gov

ALASKA OCS REGION
Minerals Management Service (MS 8200)
Office of Field Operations, Alaska OCS Region
949 East 36th Avenue, Room 308
Anchorage, AK 99508-4363
Phone: (907) 271-6065

PACIFIC OCS REGION
Minerals Management Service (MS 7100)
Office of Production, Development, and
Resource Evaluation
770 Paseo Camarillo
Camarillo, CA 93010-6064
Phone: (805) 389-7737 or 389-7700
Fax: (805) 389-7737
Internet email: pdra@mms.gov

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Amended Reporting and Situations requiring correction.

In the event of an incorrectly identified survey or misidentified survey information, please submit corrected information to the appropriate address cited above with a notation to indicate that information is a corrected copy. Examples of misidentified information may include wrong API number, wrong well bore name, or invalid survey data points, etc.

Related Links

Regulations can be found online at:

http://www.access.gpo.gov/nara/cfr/index.html

http://www.gomr.mms.gov/homepg/regulate/regs/ntlltl.html (main link)

NTLs for the Gulf of Mexico OCS Region:

NTL No. 97-06 Timely Submittal of Drilling Well Records in Accordance with 30 CFR 250.66
Effective Date: March 1, 1997

NTL No. 97-06, Attachment No. 1 Exchange Format for Directional Surveys
Effective Date: March 1, 1997

NTL No. 98-18 Change of Address for the Submittal of Certain Drilling Well Records in Accordance with 30 CFR 250.416
Effective Date: September 1, 1998

NTL No. 2000-G03 Functional Responsibility of MMS Regulations
Effective Date: January 28, 2000

NTL No. 2000-N07 Well Naming and Numbering Standards
Effective Date: May 1, 2001

NTL No. 2002-G05 Open Hole Log and Survey Information for the Weekly Activity Report
Effective Date: June 11, 2002

NTL No. 2002-G12 Revised North American Datum 83 Implementation Plan for the Gulf of Mexico
Effective Date: November 4, 2002

NTLs for the Alaska OCS Region:

http://www.mms.gov/alaska/regs/NTLS.HTM

NTLs for the Pacific OCS Region:

http://www.mms.gov/omm/pacific/offshore/ntls/ntllist.htm

Appendix

Directional Survey Digital Exchange Format

Definition of terms

1. A record consists of 80 bytes, including the carriage-return and line-feed (HEX 'ODOA').

2. A file is a group of header records and data records physically separated by an inter-record gap (a blank record) and terminating with a control Z (HEX '1A').

Specifications for digital reporting of data on diskette or compact disc

1. Suitable for any IBM PC computer or compatible.

2. 3.5" diskette or compact disc.

3. ASCII mode standard.

4. A file cannot span multiple diskettes or compact discs.

5. A diskette or compact disc may contain numerous directional surveys.

6. The label should identify each wellbore with a 12-digit API#, Lease Number, Well Name/Number, and Well Name Suffix.

7. The label should identify the name, address, and telephone number of the person to contact should problems occur when loading the data.

How to report through E-mail (GOM OCS only)

In lieu of data submittal via mail, GOMR data may be forwarded to the GOMR TDMS via E-mail at tdms@mms.gov. **Note: The MMS gateway is not encryption-protected at this time.** When submitting digital data by E-mail, provide:

1. File suitable for any IBM PC computer or compatible.

2. ASCII mode standard.

3. One directional survey per file.

4. The label should identify each wellbore with a 12-digit API#, Lease Number, Well Name/Number, and Well Name Suffix.

5. Identify the name, address, and telephone number of the person to contact should problems occur when loading the file.

Subdivision of content

1. A directional survey file should contain header record(s), data record(s), and terminate with an end-of-file marker.

2. A maximum of 10 header records may be used within each directional survey file. Header records should precede the first data record in the file. There should be a set of header records for each borehole with a unique 12-digit API number.

3. As many data records as necessary may be used within a directional survey file.

4. The diskette or compact disc may contain numerous directional surveys as long as each file and diskettes or disc are adequately labeled.

Header information, character length, and line format

The header records should be in a format that consists of the following items. Identify each header record with an "H" as the first character of the record, a blank space, then followed by the relevant data. There should be a set of header records for each borehole with a unique 12-digit API number. There can be a maximum of 10 header records used within each file for a directional , and header lines should not exceed 80 columns (characters). In addition, enter a <carriage return> after the last column used in each header record in lieu of blank spaces.

Header #1
a. Header Record ID - The letter H to identify the record as a header record in column 1 followed by a space in column 2.

b. API Number - The 12-digit API Number assigned by the MMS District to the well in columns 3 through 14.

c. Date Survey Conducted - The year, month, and day (yymmdd) the survey was completed in columns 15 through 22.

An example header record on line 1 would read: **H 177671234500 900701**<carriage return>

Header #2
a. Type of Instrument Used (e.g., magnetic single shot, magnetic multi-shot, gyroscopic, etc).

An example header record on line 2 would read: **H magnetic multi-shot** <carriage>

Header #3

a. Contractor or Service Provider - The name of the company that conducted the survey.

An example header record on line 3 would read: **H Hamberger Well Services** <carriage return>

Header #4
a. Survey Interval - The depths, in feet, of the beginning and ending measurement points.

An example header record on line 4 would read: **H 66666 99999**<carriage return>

Survey point line format. (17-digit format)

Each survey data record should contain information recorded at a given measurement point in the **borehole**. Provide a data record for each measurement point. Order survey data records beginning from the surface to the bottom of the **borehole**. The number of columns for each survey data record should total 18. Use a <carriage return> after each directional survey record in lieu of spaces after the 17th column. The content and column structures of the data records are:

Item	Column	Format	Description
1.	1-5	NNNNN	**Measured Depth:** The distance in feet from the RKB to the measurement point; do not use spaces. Please use a zero in column 1 when the depth is less than 10,000 feet. Other punctuation should not be used.
2.	6-7 8-9 10-11	NN NN NN	**Degrees┐ Inclination Angle:** The angle, in degrees, **Minutes │** minutes, and seconds, the borehole deviates **Seconds┘** from vertical at the measurement point. Do not use spaces or other punctuation in columns.
3.	12-17	NNN.NN	**Azimuth:** The azimuth, in degrees, of the **borehole** at the measurement point. The azimuth should range from 000^0 to 360^0 north. Use zeros in lieu of empty spaces. A decimal point is placed in the 15th column. The two numbers to the right of the decimal represent tenths and hundredths of a degree.
4.	18		Enter a <carriage return> in the 18th column.

Complete file format recommended for directional surveys

H□NNNNNNNNNNN*(API #)* □YYMMDD(*Date Survey Run*)
H□Type of Instrument
H□Contractor or *Survey Company* □Contact Name □Phone □E-mail address
H□Survey Interval

Data Records – (***Depth)*** NNNNN (***Angle)*** NNNNNN (***Azimuth)*** NNN.NN

Key: *N = Numeric value; A = Alphabetic value; YY = year, MM = month, DD = day; 980113 = January 13, 1998.* □ *= Blank space*

Generic example of the format for directional surveys

H 608184000801 980705
H magnetic multi-shot
H Hamberger Well Services Ron Don 555-555-5555 Ron@logger.com
H 66666 99999

00000000000000.00
00100003000040.00

Directional Survey Report Paper Copy Format

1. Legible, exact copies of service company reports shall be furnished.
2. The report should include or be annotated with:
    a. The 12-digit API number assigned by the MMS District to the borehole and survey conducted, lease number, well name and number, and well name suffix, and datum/datum transformation, and
    b. Type of instrument(s) used,
    c. Contractor or service provider(s),
    d. Survey interval.,
    e. Survey date(s)
    f. North Reference
    g. Datum, map projection, Spheroid
    h. Magnetic declination(s), and
    i. Grid convergence(s)