

Subpart D—Oil and Gas Drilling Operations

GENERAL REQUIREMENTS.

§ 250.400 Who is subject to the requirements of this subpart?

The requirements of this subpart apply to lessees, operating rights owners, operators, and their contractors and subcontractors.

[68 FR 8423, Feb. 20, 2003]

§ 250.401 What must I do to keep wells under control?

You must take necessary precautions to keep wells under control at all times. You must:

- Use the best available and safest drilling technology to monitor and evaluate well conditions and to minimize the potential for the well to flow or kick;

- Have a person on site during drilling operations who represents your interests and can fulfill your responsibilities;

- Ensure that the toolpusher, operator's representative, or a member of the drilling crew maintains continuous surveillance on the floor from the beginning of drilling operations until the well is completed or abandoned, unless you have secured the well with blowout preventers (BOPs), bridge plugs, cement plugs, packers;

- Use personnel trained according to the provisions of subpart O, and;

- Use and maintain equipment and materials necessary to ensure the safety and protection of personnel, equipment, natural resources, and the environment.

[68 FR 8423, Feb. 20, 2003]

§ 250.402 When and how must I secure a well?

Whenever you interrupt drilling operations, you must install a downhole safety device, such as a cement plug, bridge plug, or packer. You must install the device at an appropriate depth within a properly cemented casing string or liner.

- Among the events that may cause you to interrupt drilling operations are:

- Evacuation of the drilling crew;

- Inability to keep the drilling rig on location; or
- Repair to major drilling or well control equipment.

- For floating drilling operations, the District Manager may approve the use of blind or blind-shear rams or plugs and an inside BOP if you don't have time to install a downhole safety device, or if special circumstances occur.

[68 FR 8423, Feb. 20, 2003]

§ 250.403 What drilling unit movements must I report?

- You must report the movement of all drilling units on and off drilling locations to the District Manager. This includes both MODU and platform rigs. You must inform the District Manager 24 hours before:

- The arrival of an MODU on location;
- The movement of a platform rig to a platform;
- The movement of a platform rig to another slot;

- The movement of an MODU to another slot; and

- The departure of an MODU from the location.

- You must provide the District Manager with the rig name, lease number, well number, and expected time of arrival or departure.

- In the Gulf of Mexico OCS Region, you must report drilling unit movements on form MMS-144, Rig Movement Notification Report.

[68 FR 8423, Feb. 20, 2003]

§ 250.404 What are the requirements for the crown block?

You must have a crown block safety device that prevents the traveling block from striking the crown block. You must check the device for proper operation at least once per week and after each drill-line slipping operation and record the results of this operational check in the driller's report.

[68 FR 8423, Feb. 20, 2003]

§ 250.405 What are the safety requirements for diesel engines used on a drilling rig?

You must equip each diesel engine with an air take device to shut down

the diesel engine in the event of a runaway.

- For a diesel engine that is not continuously manned, you must equip the engine with an automatic shutdown device;

- For a diesel engine that is continuously manned, you may equip the engine with either an automatic or remote manual air intake shutdown device;

- You do not have to equip a diesel engine with an air intake device if it meets one of the following criteria:

- Starts a larger engine;
- Powers a firewater pump;
- Powers an emergency generator;
- Powers a BOP accumulator system;
- Provides air supply to divers or confined entry personnel;
- Powers temporary equipment on a nonproducing platform;
- Powers an escape capsule; or
- Powers a portable single-cylinder rig washer.

[68 FR 8423, Feb. 20, 2003]

§ 250.406 What additional safety measures must I take when I conduct drilling operations on a platform that has producing wells or has other hydrocarbon flow?

You must take the following safety measures when you conduct drilling operations on a platform with producing wells or that has other hydrocarbon flow:

- You must install an emergency shutdown station near the driller's console;

- You must shut in all producible wells located in the affected wellbay below the surface and at the wellhead when:

- You move a drilling rig or related equipment on and off a platform. This includes rigging up and rigging down activities within 500 feet of the affected platform;

- You move or skid a drilling unit between wells on a platform;

- A mobile offshore drilling unit (MODU) moves within 500 feet of a platform. You may resume production once the MODU is in place, secured, and ready to begin drilling operations.

[68 FR 8423, Feb. 20, 2003]

§ 250.407 What tests must I conduct to determine reservoir characteristics?

You must determine the presence, quantity, quality, and reservoir characteristics of oil, gas, sulphur, and water in the formations penetrated by logging, formation sampling, or well testing.

[68 FR 8423, Feb. 20, 2003]

§ 250.408 May I use alternative procedures or equipment during drilling operations?

You may use alternative procedures or equipment during drilling operations after receiving approval from the District Manager. You must identify and discuss your proposed alternative procedures or equipment in your Application for Permit to Drill (APD) (Form MMS-123) (see § 250.414(h)). Procedures for obtaining approval are described in section 250.14 of this part.

[68 FR 8423, Feb. 20, 2003, as amended at 72 FR 25201, May 4, 2007]

§ 250.409 May I obtain departures from these drilling requirements?

The District Manager may approve departures from the drilling requirements specified in this subpart. You may apply for a departure from drilling requirements by writing to the District Manager. You should identify and discuss the departure you are requesting in your APD (see § 250.414(h)).

[68 FR 8423, Feb. 20, 2003]

APPLYING FOR A PERMIT TO DRILL

§ 250.410 How do I obtain approval to drill a well?

You must obtain written approval from the District Manager before you begin drilling any well or before you sidetrack, bypass, or deepen a well. To obtain approval, you must:

- Submit the information required by § 250.411 through 250.418;

- Include the well in your approved Exploration Plan (EP), Development and Production Plan (DPP), or Development Operations Coordination Document (DOCD);

(c) Meet the oil spill financial responsibility requirements for offshore facilities as required by 30 CFR part 253, and

(d) Submit the following to the District Manager:

- (1) An original and two complete copies of Form MMS-123, Application for Permit to Drill (APD), and Form MMS-123S, Supplemental APD Information Sheet;
- (2) A separate public information copy of forms MMS-123 and MMS-123S that meets the requirements of § 250.186; and
- (3) Payment of the service fee listed in § 250.125.

[68 FR 8423, Feb. 20, 2003, as amended at 71 FR 40811, July 19, 2006; 72 FR 25201, May 14, 2007]

§ 250.411 What information must I submit with my application?

In addition to forms MMS-123 and MMS-123S, you must include the information described in the following table.

Information that you must include with an application for an APD	Where to find a description
(a) Plot that shows locations of the proposed well.	§ 250.412
(b) Design criteria used for the proposed well.	§ 250.413
(c) Drilling proposals.	§ 250.414
(d) Casing and cementing programs.	§ 250.415
(e) Diverter and BOP systems descriptions.	§ 250.416
(f) Requirements for using a MODU.	§ 250.417
(g) Additional information.	§ 250.418

[68 FR 8423, Feb. 20, 2003]

§ 250.412 What requirements must the location plot meet?

- (a) The location plot must:
 - (1) Have a scale of 1:24,000 (1 inch = 2,000 feet);
 - (2) Show the surface and subsurface locations of the proposed well and all the wells in the vicinity;
 - (3) Show the surface and subsurface locations of the proposed well in feet or meters from the blockline;
 - (4) Contain the longitude and latitude coordinates, and either Universal Transverse Mercator, grid-system coordinates or state plane coordinates in the Lambert or Transverse Mercator Projection system for the surface and

subsurface locations of the proposed well; and

(e) State the units and geodetic datum (including whether the datum is North American Datum 27 or 83) for these coordinates. If the datum was converted, you must state the method used for this conversion, since the various methods may produce different values.

[68 FR 8423, Feb. 20, 2003]

§ 250.413 What must my description of well drilling design criteria address?

Your description of well drilling design criteria must address:

- (a) Pore pressures;
- (b) Formation fracture gradients; and
- (c) Potential lost circulation zones;
- (d) Drilling fluid weights;
- (e) Casing setting depths;
- (f) Maximum anticipated surface pressures. For this section, maximum anticipated surface pressures are the pressures that you reasonably expect to be exerted upon a casing string and its related wellhead equipment. In calculating maximum anticipated surface pressures, you must consider drilling completion, and producing conditions; drilling fluid densities to be used below various casing strings; fracture gradients of the exposed formations; casing setting depths; total well depth; formation fluid types; safety margins and other pertinent conditions. You must include the calculations used to determine the pressures for the drilling and the completion phases, including the anticipated surface pressure used for designing the production string;
- (g) A single plot containing estimated pore pressures, formation fracture gradients, proposed drilling fluid weights, and casing setting depths in true vertical measurements;
- (h) A summary report of the shallow hazards site survey that describes the geological and manmade conditions not previously submitted; and
- (i) Permafrost zones, if applicable.

[68 FR 8423, Feb. 20, 2003]

§ 250.414 What must my drilling prognosis include?

Your drilling prognosis must include a brief description of the procedures

you will follow in drilling the well. This prognosis includes but is not limited to the following:

- (a) Projected plans for coring at specified depths;
- (b) Projected plans for logging;
- (c) Planned safe drilling margin between proposed drilling fluid weights and estimated pore pressures. This safe drilling margin may be shown on the plot required by § 250.413(g);
- (d) Estimated depths to the top of significant marker formations;
- (e) Estimated depths to significant porous and permeable zones containing fresh water, oil, gas, or abnormally pressured formation fluids;
- (f) Estimated depths to major faults; and
- (g) Estimated depths of permafrost, if applicable;
- (h) A list and description of all requests for using alternative procedures or departures from the requirements of this subpart in one place in the APD. You must explain how the alternative procedures afford an equal or greater degree of protection, safety, or performance, or why you need the departures; and
- (i) Projected plans for well testing (refer to § 250.460 for safety requirements).

[68 FR 8423, Feb. 20, 2003]

§ 250.415 What must my casing and cementing programs include?

- (a) Your casing and cementing programs must include:
 - (1) Hole sizes and casing sizes, including weights, grades, collapse, and burst values; types of connection; and setting depths (measured and true vertical depth (TVD));
 - (2) Casing design safety factors for tension, collapse, and burst with the assumptions made to arrive at these values;
 - (3) Type and amount of cement (in cubic feet) planned for each casing string; and
 - (4) In areas containing permafrost, setting depths for conductor and surface casing based on the anticipated depth of the permafrost. Your program must provide protection from thaw subsidence and freezeback effect, proper anchorage, and well control.
- (e) A statement of how you evaluated the best practices included in API RP

65, Recommended Practice for Cementing Shallow Water-Flow Zones in Deep Water Wells (Incorporated by reference as specified in § 250.198), you drill a well in water depths greater than 500 feet and are in either of the following two areas:

- (1) An "area with an unknown shallow water flow potential" is a zone or geologic formation where neither the presence nor absence of potential for a shallow water flow has been confirmed;
- (2) An "area known to contain a shallow water flow hazard" is a zone or geologic formation for which drilling has confirmed the presence of shallow water flow.

[68 FR 8423, Feb. 20, 2003, as amended at 72 FR 8903, Feb. 28, 2007]

§ 250.416 What must I include in the diverter and BOP descriptions?

You must include in the diverter and BOP descriptions:

- (a) A description of the diverter system and its operating procedures;
- (b) A schematic drawing of the diverter system (plan and elevation views) that shows:
 - (1) The size of the annular BOP installed in the diverter housing;
 - (2) Spool outlet internal diameter(s);
 - (3) Diverter-line lengths and diameters, burst strengths and radius of curvature at each turn; and
 - (4) Valve type, size, working pressure rating, and location;
- (c) A description of the BOP system and system components, including pressure ratings of BOP equipment and proposed BOP test pressures;
- (d) A schematic drawing of the BOP system that shows the inside diameter of the BOP, stack, number and type of preventers, location of choke and kill lines, and associated valves; and
- (e) Information that shows the blind-shear rams installed in the BOP stack (both surface and subsea stacks) are capable of shearing the drill pipe in the hole under maximum anticipated surface pressures.

[68 FR 8423, Feb. 20, 2003]

§ 250.417 What must I provide if I plan to use a mobile offshore drilling unit (MODU)?

If you plan to use a MODU, you must provide:

(a) *Fitness requirements.* You must provide information and data to demonstrate the drilling unit's capability to perform at the proposed drilling location. This information must include the maximum environmental and operational conditions that the unit is designed to withstand including the minimum air gap necessary for both hurricane and non-hurricane seasons. If sufficient environmental information and data are not available at the time you submit your APD, the District Manager may approve your APD but require you to collect and report this information during operations. Under this circumstance, the District Manager has the right to revoke the approval of the APD if information collected during operations show that the drilling unit is not capable of performing at the proposed location.

(b) *Foundation requirements.* You must provide information to show that site-specific soil and oceanographic conditions are capable of supporting the proposed drilling unit. If you provided sufficient site-specific information in your EP, DPP, or DOCD, you may reference that information. The District Manager may require you to conduct additional surveys and soil borings before approving the APD if additional information is needed to make a determination that the conditions are capable of supporting the drilling unit.

(c) *Frontier areas.* (1) If the design of the drilling unit you plan to use in a frontier area is unique or has not been proven for use in the proposed environment, the District Manager may require you to submit a third-party review of the unit's design. If required, you must obtain the third-party review according to § 250.945 through § 250.918. You may submit this information before submitting an APD.

(2) If you plan to drill in a frontier area, you must have a contingency plan that addresses design and operating limitations of the drilling unit. Your plan must identify the actions necessary to maintain safety and prevent damage to the environment. Actions must include the suspension, curtailment, or modification of drilling or rig operations to remedy various operational or environmental situations (e.g., vessel motion, riser offset, anchor

tensions, wind speed, wave height, currents, icing or ice-loading, settling, tilt or lateral movement, resupply capability).

(d) *U.S. Coast Guard (USCG) documentation.* You must provide the current Certificate of Inspection or Letter of Compliance from the USCG. You must also provide current documentation of any operational limitations imposed by an appropriate classification society.

(e) *Floating drilling unit.* If you use a floating drilling unit, you must indicate that you have a contingency plan for moving off location in an emergency situation.

(f) *Inspection of unit.* The drilling unit must be available for inspection by the District Manager before commencing operations.

(g) Once the District Manager has approved a MODU for use, you do not need to re-submit the information required by this section for another APD to use the same MODU unless changes in equipment affect its rated capacity to operate in the District.

[68 FR 8423, Feb. 20, 2003, as amended at 72 FR 26201, May 4, 2007]

§ 250.418 What additional information must I submit with my APD?

You must include the following with the APD:

(a) Rated capacities of the drilling rig and major drilling equipment, if not already on file with the appropriate District office;

(b) A drilling fluids program that includes the minimum quantities of drilling fluids and drilling fluid materials, including weight materials, to be kept at the site;

(c) A proposed directional plot if the well is to be directionally drilled;

(d) A Hydrogen Sulfide Contingency Plan (see § 250.490), if applicable, and not previously submitted;

(e) A welding plan (see § 250.109 to 250.113) if not previously submitted;

(f) In areas subject to subfreezing conditions, evidence that the drilling equipment, BOP systems and components, diverter systems, and other associated equipment and materials are suitable for operating under such conditions;

buckling loads; burst and collapse pressures; thermal effects; and combinations thereof.

(2) The casing design must include safety measures that ensure well control during drilling and safe operations during the life of the well.

(c) *Cementing requirements.* You must design and conduct your cementing jobs so that cement composition, placement techniques, and waiting times ensure that the cement placed behind the bottom 500 feet of casing attains a minimum compressive strength of 500 psi before drilling out of the casing or before commencing completion operations.

[68 FR 8423, Feb. 20, 2003]

§ 250.421 What are the casing and cementing requirements by type of casing string?

The table in this section identifies specific design, setting, and cementing requirements for casing strings and liners. For the purposes of subpart D, the casing strings in order of normal installation are as follows: drive or structural, conductor, surface, intermediate and production casings (including liners). The District Manager may approve or prescribe other casing and cementing requirements where appropriate.

Casing type	Casing requirements	Cementing requirements
(a) Drive or Structural	Set by driving, jelling, or drilling to the minimum depth as approved or prescribed by the District Manager.	If you drilled a portion of this hole, you must use enough cement to fill the annular space back to the mudline. Use enough cement to fill the calculated annular space back to the mudline. Verify annular fill by observing cement returns. If you cannot observe cement returns, use additional cement to ensure fill-back to the mudline. For drilling on an artificial island or when using a glory hole, you must discuss the cement fill level with the District Manager.
(b) Conductor	Design casing and select setting depths based on relevant engineering and geologic factors. These factors include the presence or absence of hydrocarbons, potential hazards, and water depths. Set casing immediately before drilling into formations known to contain oil or gas. If you encounter oil or gas or unexpected formation pressure before the planned casing point, you must set casing immediately.	Use enough cement to fill the calculated annular space to at least 200 feet inside the conductor casing. When geologic conditions such as near-surface fractures and faulting exist, you must use enough cement to fill the calculated annular space to the mudline.
(c) Surface	Design casing and select setting depths based on relevant engineering and geologic factors. These factors include the presence or absence of hydrocarbons, potential hazards, and water depths.	Use enough cement to cover and isolate all hydrocarbon-bearing zones and isolate abnormal pressure intervals from normal pressure intervals in the well. As a minimum, you must cement the annular space 500 feet above the casing shoe and 500 feet above each zone to be isolated.
(d) Intermediate	Design casing and select setting depth based on anticipated or encountered geologic characteristics or wellbore conditions.	

Casing type	Casing requirements	Cementing requirements
(a) Production	Design casing and select setting depth based on anticipated or unanticipated geologic characteristics or wellbore conditions.	Use enough cement to cover, or isolate all, hydrocarbon-bearing zones above the shoe. As a minimum, you must cement the annular space at least 500 feet above the casing shoe and 500 feet above the uppermost hydrocarbon-bearing zone.
(f) Liners	If you use a liner as conductor or surface casing, you must set the top of the liner at least 200 feet above the previous casing/liner shoe. If you use a liner as an intermediate string below a surface string or production casing below an intermediate string, you must set the top of the liner at least 100 feet above the previous casing shoe.	Same as cementing requirements for specialty casing types. For example, a liner used as an intermediate casing must be cemented according to the cementing requirements for intermediate casing.

[68 FR 8423, Feb. 20, 2003]

\$250.422 When may I resume drilling after cementing?

(a) After cementing surface, intermediate, or production casing (or liners), you may resume drilling after the cement has been held under pressure for 12 hours. For conductor casing, you may resume drilling after the cement has been held under pressure for 8 hours. One acceptable method of holding cement under pressure is to use float valves to hold the cement in place.

(b) If you plan to riddle down your diverter or BOP stack during the 8- or 12-hour waiting time, you must determine, before riddling down, when it will be safe to do so. You must base your determination on a knowledge of formation conditions, cement composition, effects of riddling down, presence of potential drilling hazards, well conditions during drilling, cementing, and post cementing, as well as past experience.

[68 FR 8423, Feb. 20, 2003]

\$250.423 What are the requirements for pressure testing casing?

The table in this section describes the minimum test pressures for each string of casing. You may not resume drilling or other down-hole operations until you obtain a satisfactory pressure test. If the pressure declines more than 10 percent in a 30-minute test or if there is another indication of a leak, you must re-cement, repair the casing, or run additional casing to provide a proper seal. The District Manager may

which the liner will be subjected during the formation pressure-integrity test below that liner shoe, or subsequent liner shoes if set. The District Manager may approve or require other liner test pressures.

(b) You must test each production liner (and liner-lap) to a minimum of 500 psi above the formation fracture pressure at the casing shoe into which the liner is lapped.

(c) You may not resume drilling or other down-hole operations until you obtain a satisfactory pressure test. If the pressure declines more than 10 percent in a 30-minute test or if there is another indication of a leak, you must re-cement, repair the liner, or run additional casing/liner to provide a proper seal.

[68 FR 8423, Feb. 20, 2003]

\$250.426 What are the recordkeeping requirements for casing and liner pressure tests?

You must record the time, date, and results of each pressure test in the driller's report maintained under standard industry practice. In addition, you must record each test on a pressure chart and have your onsite representative sign and date the test as being correct.

[68 FR 8423, Feb. 20, 2003]

\$250.427 What are the requirements for pressure integrity tests?

You must conduct a pressure integrity test below the surface casing or

liner and all intermediate casings or liners. The District Manager may require you to run a pressure-integrity test at the conductor casing shoe if warranted by local geologic conditions or the planned casing setting depth. You must conduct each pressure integrity test after drilling at least 10 feet but no more than 50 feet of new hole below the casing shoe. You must test to either the formation leak-off pressure or to an equivalent drilling fluid weight if identified in an approved APD.

(a) You must use the pressure integrity test and related hole-behavior observations, such as pore-pressure test results, gas-cut drilling fluid, and well kicks to adjust the drilling fluid program and the setting depth of the next casing string. You must record all test results and hole-behavior observations made during the course of drilling related to formation integrity and pore pressure in the driller's report.

(b) While drilling, you must maintain the safe drilling margin identified in the approved APD. When you cannot maintain this safe margin, you must suspend drilling operations and remedy the situation.

[68 FR 8423, Feb. 20, 2003]

\$250.428 What must I do in certain cementing and casing situations?

The table in this section describes actions that lessees must take when certain situations occur during casing and cementing activities.

If you encounter the following situation:	Then you must . . .
(a) Have unexpected formation pressures or conditions that warrant revising your casing design.	Submit a revised casing program to the District Manager for approval.
(b) Need to increase casing setting depths more than 100 feet true vertical depth (TVD) from the approved APD due to conditions encountered during drilling operations.	Submit those changes to the District Manager for approval.
(c) Have indication of inadequate cement job (such as lost returns, cement channeling, or failure of equipment).	(1) Pressure test the casing shoe; (2) Run a temperature survey; (3) Run a cement bond log; or (4) Use a combination of these techniques.
(d) Inadequate cement job	Re-cement or take other remedial actions as approved by the District Manager. Isolate those intervals from normal pressures by squeeze cementing before you complete; suspend operations; or abandon the well, whichever occurs first.
(e) Primary cement job that did not isolate abnormal pressure intervals.	Have at least two cemented casing strings (does not include liners) in the well. Note: All producing wells must have at least two cemented casing strings. Submit geologic data and information to the District Manager that demonstrates the absence of shallow hydrocarbons or hazards. This information must include logging and drilling fluid-monitoring from wells previously drilled within 500 feet of the proposed well path down to the next casing point.
(f) Decide to produce a well that was not originally contemplated for production.	
(g) Want to drill a well without setting conductor casing.	