UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT

NATIONAL NOTICE TO LESSEES AND OPERATORS OF FEDERAL OIL, GAS, AND SULPHUR
LEASES, OUTER CONTINENTAL SHELF

BSEE NTL No 2012-N01

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Calculating Maximum Anticipated Surface Pressure and Expected Surface Pressure for the Completion Case and Estimated Shut-in Tubing Pressure Prior to Production

Purpose

The purpose of this Notice to Lessees and Operators (NTL) is to clarify the definitions of the maximum anticipated surface pressure for the completion case (MASPcc), expected surface pressure for the completion case (ESPcc), and the estimated shut-in tubing pressure (SITP) prior to actual production. This NTL also establishes the conditions when you may use an oil gradient and when you must use a gas gradient to calculate the MASPcc, ESPcc, and the estimated SITP.

The calculation of MASPcc, ESPcc, and the estimated SITP prior to actual production is critical for proper selection of completion and well control equipment. The terms ***maximum anticipated surface pressure*** (MASP) for completions used in 30 CFR 250, Subpart D – Oil and Gas Drilling Operations, and the term ***expected surface pressure*** (ESP) used in 30 CFR 250, Subpart E – Oil and Gas Well-Completion Operations, have the exact same meaning and are derived from the exact same formulas. ***Shut-in tubing pressure*** (SITP), as used in Subpart E, is a measured value determined after the well is placed on production; but an estimated value for the SITP must be made before the well is completed for the selection, purchase, and installation of completion equipment. The estimated SITP prior to initiation of production and the term ESP as used in Subpart E are numerically the same.

Authority

Under 30 CFR 250.413(f), MASPs are the pressures that you reasonably expect to be exerted upon a casing string and its related wellhead equipment during drilling operations. In calculating MASPs, you must consider drilling, ***completion***, and production conditions. You must include in your Application for Permit to Drill (APD) the calculations you used to determine the pressures for the drilling and the ***completion*** phases, including the anticipated surface pressure used for designing the production string.

Under 30 CFR 250.515(a), the blowout preventer (BOP) system and system components and related well-control equipment shall be designed, used, maintained, and tested in a manner necessary to assure well control in foreseeable conditions and circumstances. The working pressure rating of the BOP system and system components shall exceed the ESP to which they may be subjected.

Under 30 CFR 250.517(d), wellhead, tree, and related equipment shall have a pressure rating greater than the SITP and shall be designed, installed, used, maintained, and tested so as to achieve and maintain pressure control. Since you must purchase and install the wellhead, tree, and related equipment before the well begins producing, you must estimate the SITP for the selection of this equipment. Once the well is placed on production, the SITP is no longer an estimated value, but a direct measurement.

Policy

The Bureau of Safety and Environmental Enforcement (BSEE) has established the following policies and guidance with respect to the calculation of MASPcc, ESPcc, and SITP:

1. The terms MASP (as used in 30 CFR 250.413(f)) for the completion case (MASPcc), ESP (as used in 30 CFR 250.515(a)) for the completion case (ESPcc), and the estimated SITP (as used in 30 CFR 250.517(d)) before production begins are calculated using the same methodology and are all numerically equal for the same well.

2. Do not consider the density (ρ) of the completion fluid when calculating the MASPcc, ESPcc, or estimated SITP.

3. Calculate the MASPcc and ESPcc at the surface for a surface BOP and at the mudline for a subsea BOP. Calculate the estimated SITP at the surface for a surface tree and at the mudline for a subsea tree.

4. If the well bore has a gas reservoir contained within the primary cement for the production casing or production liner as defined in 30 CFR 250.421, or if the presence of gas is unknown, use a gas gradient to calculate the MASPcc, ESPcc, or estimated SITP. Use a gas gradient in making these calculations regardless of your plans to complete or not complete the gas reservoir in the well.

5. If the properties of the gas are unknown, use a dry gas maximum fluid specific gravity (SG) of 0.6 (reference $SG_{air}=1.0$), and determine the fluid specific density (ρ) based on the maximum reservoir pressure, appropriate wellbore thermal gradient, and the appropriate gas compressibility factor (z) when calculating the MASPcc, ESPcc, or estimated SITP.

6. If you have determined the reservoir fluid pressure-volume-temperature (PVT) (gas) properties through laboratory analysis, you may use the specific properties of the reservoir gas to determine the gas gradient.

7. If the wellbore does not have a gas reservoir contained within the primary cement for the production casing or production liner as defined in 30 CFR 250.421, you may use an oil gradient to calculate the MASPcc, ESPcc, or estimated SITP for the well completion provided:

a. Using well log data, you can demonstrate the absence of a gas reservoir within the hydrocarbon-bearing zones of the producing interval;
b. You use a fluid-specific density based on the reservoir fluid PVT (oil and gas) properties, the maximum source pressure, and the appropriate wellbore thermal gradient; and
c. If the reservoir fluid PVT (oil and gas) properties are not known from laboratory analysis, you use an oil gradient of 0.23 psi/foot to calculate the MASPcc, ESPcc, or the estimated SITP for the initial completion in the zone.

Guidance Document Statement

The BSEE issues NTLs as guidance documents in accordance with 30 CFR 250.103 to clarify, supplement, and provide more detail about certain BSEE regulatory requirements and to outline the information you must provide in your various submittals. Under that authority, this NTL sets forth a policy on and an interpretation of a regulatory requirement that provides a clear and consistent approach to complying with that requirement. If you wish to use an alternate approach for compliance, you may do so after you receive approval from the appropriate BSEE office under 30 CFR 250.141.

Paperwork Reduction Act of 1995 Statement

The information collection referred to in this NTL provides clarification, description, or interpretation of requirements contained in 30 CFR 250, Subparts D and E. The Office of Management and Budget (OMB) approved the information collection requirements for these regulations and assigned OMB Control Numbers 1014-0018 and 1014-0004, respectively. This NTL does not impose any additional information collection requirements subject to the Paperwork Reduction Act of 1995.

Contacts

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