RULES PROCESSING TEAM

JUL 2 0 2006

July 19, 2006

Department of Interior
Minerals Management Service
381 Elden Street MS-4024
Herndon, VA 20170-4817

Attention: Rules Processing Team
Reference: Incorporating API RP 65 for Cementing Shallow Water Flow Zones; MMS RIN 1010-AD19

Dear Madam or Sir,

BJ Services Company appreciates the opportunity to comment on the proposed incorporation of API RP 65, First Edition, into MMS regulations. Further, BJ Services Company recognizes the efforts of MMS to provide the oil and gas industry with guidance in sequestering shallow water flow – the most feared of the geohazards associated with deepwater drilling.

API RP 65 was written in the year 2000-2002 time frame, and accordingly the best demonstrated practices contained in document reflect the knowledge and experience gained through the 1990's. The document clearly favors the use of foamed cement, then the industry choice for shallow water flow mitigation. Since 2002 however, other non-foamed technologies have demonstrated success in minimizing or mitigating shallow water flow. Unfortunately, the current edition of API RP 65 does not place these high performance non-foamed systems on the same level of preference as foamed cement.

Statements within API RP 65 move the user towards the use of foamed cement systems for shallow water flow mitigation with verbiage such as:

"*Foamed cements are the highest performing cements for low temperature and applications requiring potential flow control….*" (Section 11.2, sixth paragraph)

and

"*Foamed cement provides the best combination of cement liquid and set properties for this* (flow) *situation*". (Section 11.3, first paragraph).

In another example of technical bias towards foamed cement, Appendix F of API RP 65 contains a scorecard which provides 12 additional points (out of a total of 112) for the use of compressible (foamed) cement systems and the requisite automation and process controls. If this scorecard is to be used as a metric by which operators are judged for

BJ Services Company, U.S.A. • 11211 FM 2920 • Tomball, TX 77375
Office: (281) 351-8131 • Fax: (281) 351-3409

compliance with the tenants of document, then operators who choose non-foamed cement solutions in shallow water flow environments will be automatically penalized.

While not intending to suggest a complete rewrite of API RP 65, BJ Services Company recommends the following editorial and technical changes be made to the existing document:

SECTION 11.1 GENERAL

Page 10, right hand column, fourth full paragraph, delete, *"The gaseous component can be either a gas that is developed internally in the slurry due to a chemical reaction, or it can be a gas that is introduced into the slurry before being pumped into the well, that is, foamed".*

SECTION 11.2 BASE CEMENT COMPOSITIONS

Replace existing contents with the following:

Several cementing materials or compositions meet the objectives of cementing the shallow casings where there is a risk of SWF (SPE 62957, SPE/IADC 67774, OTC 8304, OTC 8305 and OTC 11977). These include, but are not limited to:

a. API and ASTM cements, in many cases containing accelerators to speed up hydration and compressive strength development.
b. Special manufactured lightweight cements.
c. High aluminate cements and blends.
d. Blends containing micro-fine cements.
e. Blends containing calcium sulfate hemi-hydrate.
f. Blends containing proprietary, fit-for-purpose additives.

Because of the low fracture gradients typically found in the top-hole section of a deepwater well, it is generally not possible to place a full annular column of normal density cement (14.8 lbm/gal–16.4 lbm/gal) from total casing depth back to the mudline. Therefore, a low density "lead" cement normally occupies a portion of the cemented annulus. Further, as the casing shoe can be a considerable distance downhole from the uppermost SWF interval, the casing – wellbore annulus adjacent to the SWF interval is usually isolated by a low-density cement slurry.

Most cements can be formulated to achieve the properties required for placement, creating and sustaining zonal isolation in a deepwater environment. Experience has shown that API Classes A, C, G and H or ASTM Types I, II and III cements can be used to mitigate SWF. As discussed previously, these base cements may include other special additives to enhance the performance of the cement formulation. High-performance blends or foamed cements may be justified or required for more extreme SWF situations, particularly in multi-well template developments to maximize the probability of success.

There are two principal methods to prepare cement slurries capable of SWF mitigation. The first method employs hollow, low specific gravity microspheres that do not require additional mix water in order to reduce slurry density. Such materials allow preparation of high performance, low density cement slurries. Specialized additives are also incorporated to impart the performance parameters discussed in Section 11.1 (e.g., fluid loss, thickening time, slurry stability, etc.). Cementing operations employing high-performance cements are less complex than those involving foamed cements. However, once the high-performance lightweight design is optimized, blended and stored on the rig, the permissible slurry-density range is limited.

A second design method involves injecting a controlled amount of nitrogen gas into a cement slurry containing a foaming agent. These foamed cement systems (IADC/SPE 59136, IADC/SPE 59170, SPE 62957, OTC 8304, OTC 8305 and OTC 11976) provide a measure of internal pressure maintenance to combat volume losses that occur before the cement sets. As a result, foamed systems can often offset hydrostatic pressure losses which cause the under balanced condition that initiates SWF. Foamed cements provide enhanced fluid-loss control, mechanical durability, and mud displacement efficiency. In addition, only one cement formulation is usually required for storage on the rig. Foamed cements can be employed at in situ densities 4 to 5 lbm/gal lower than the base cement density.

SECTION 11.3 CEMENT FORMULATION AND PROPERTIES

Delete *"(foamed, unfoamed, gas-entraining/gas generating)"* from second sentence.

Delete last sentence of first paragraph, *"Foamed cement provides the best combination of cement liquid and set properties for this* (flow) *situation".*

APPENDIX D

Include a standard practice for use of high-performance cements.

APPENDIX F

Current cementing matrix scoring biased towards foamed cement as compared to high performance non-foamed cements. Edit as follows:

In the Critical Cementing Fluids Parameters Section, replace first item in Slurry Design Parameter Section from *"Compressible slurries are used"*, to *Compressible or High-performance slurries are used".* Maximum point value remains at 5. In the Critical Cementing Equipment Section, all five parameters become malice points, i.e., failure to adhere to the recommended criteria results in point deduction. Change Parameter point values to the following:

Cement Mixing Equipment – Failure to use computer assisted density controlled mixer or batch mixer – maximum deduction: 2 Points

Nitrogen Injection (Foamed Cement) – Failure to use automated, process controlled injection equipment – maximum deduction: 3 Points

Liquid Additive and nitrogen at proper ratio – Failure to maintain additive concentrations and nitrogen volumes within 10% of design – maximum deduction: 3 Points

Replace "*Bulk cement delivery*" parameter with "*Job interruptions*" – Job interruptions greater than 10 minutes: 2 Points

Density Control – Deviation in density greater than 0.2 lbm/gal: 2 Points

In the Federal Register, MMS solicits comments on two questions regarding API RP 65. The first asks, *"Is there benefit to singling out a specific cementing technique or "best practice" included in this standard to incorporate into MMS regulations in lieu of incorporating the entire standard?"* To this question BJ Services Company responds that singling out a specific cementing technique or best practice would to limit the application of methods and technologies that have been developed since API RP 65 was written. Future method and technology development would also be hindered.

The second question asks, *"Are there other cementing applications in MMS regulations (e.g. well abandonment operations, general cementing requirements included in 30 CFR 250.415) where the cementing techniques discussed in API RP 65 could be used to enhance the safety if it was incorporated into our regulations"*. To this question BJ Services Company responds that API RP 65 was written to provide guidance in combating a specific geohazard, found predominantly in the tophole sections of deepwater wells. To include this document into regulations covering more general elements of oil and gas drilling would not be appropriate.

Thank you for the opportunity to comment on this matter. Should you have any questions or require clarification, please contact me at 281-357-2808.

Respectfully yours,

Dan T. Mueller
Chairman: API Subcommittee 10
Product Line Technology Manager – Cementing
BJ Services Company