

Date	Block/lease #	Description of incident
1/24/96	Eugene Island 380, G 2327	During completion operations, the well began to flow while the tubing was extended above the BOP stack. Crew tried to stab the top drive into the top of the tubing but the flow prevented the connection. The driller closed the blind rams to reduce the flow but that did not help. When gas began to flow out of the top of the tubing, the drilling crew closed the pipe rams and annular preventer and evacuated the rig. During the evacuation of the rig and platform, the well caught fire. Fire destroyed the rig substructure and derrick and severely damaged other parts of the rig. MMS investigation report recommended that blind-shear rams be required in surface BOP stacks. (incident 1 in above discussion).
5/31/97	East Cameron 83, G 8641	Blowout during completion operations. Well control team replaced pipe rams with blind-shear rams but found that the tool joint was opposite the rams. There were no injuries, pollution, or fire. Well was out of control for 19 days.
12/2/99	SM58, G 01194	Blowout occurred while running a gravel pack assembly during completion activities. The gravel pack was across the BOP stack when the well began to flow. The BOP's were closed but did not stop the blowout. The well bridged over the next day.
7/6/01	Eugene Island 277, OCS-G 10744.	Blowout occurred during a workover operation. Well flowed uncontrolled through the drill pipe and ruptured pressure safety valve on the mud pump. The area around the rig equipment and drill floor became inundated with a hazardous accumulation of gas and formation sand thus forcing all personnel to evacuate to a standby boat. There were no injuries and only minor damages to the rig. (incident 2 in above discussion).
7/13/01	Brazos 417, OCS-G 22190	Blowout occurred during drilling operations. The well kicked and flowed up the drill pipe. The rig floor safety valve was stabbed but would not close with two men applying torque to the handle. Both men were burned on their arms and back by the hot mud. Because of the high temperature of the mud, the men had to put on slicker suits and were sprayed with water to continue working on the rig floor. The crew was ordered to abandon the rig. After the rig was abandoned, it was discovered that the night supervisor was missing. The Coast Guard searched for two days but the person was never found. The BOP stack, casing and drill pipe were damaged by high pressure gas and sand that flowed from the well. The rig was also damaged by the gas and sand flow. (incident 3 in above discussion).

IADC commented that we underestimated the number of blind-shear rams by approximately 50 percent (80), thus underestimating the costs by 50 percent. We have reexamined the number of rams that industry would have to purchase and found that of the rigs currently active or ready to work, 100 surface BOP stacks did not have blind-shear rams. When rigs temporarily taken out of service are included, 170 sets of blind-shear rams would be needed. Part of our low estimate was due to the increased drilling activity since we prepared the proposed rule and part was due to a low estimate of the number of blind-shear rams already

installed in surface BOP stacks. Our recent review found that at least 30 sets of blind-shear rams are currently installed in surface BOP stacks.

MMS made two assumptions when estimating the cost of upgrading existing surface BOP stacks to include blind-shear rams. First, it was projected that all rigs active or ready to work would remain in service for more than the next 3 years. Second, one-half of the rigs temporarily taken out of service would be placed back into long term service over the next 3 years. Increasing the number of blind-shear rams needed to comply with this requirement to 135 sets will raise costs estimated in the

proposed rule from \$14,000,000 to \$14,175,000. The original cost per set of blind-shear rams was overstated (\$175,000), and has been reduced (\$105,000) according to information obtained recently from BOP manufacturers. Given the number of rams that industry will have to purchase, MMS has allowed a 3-year timeframe for installing the rams versus the 1-year timeframe identified in the proposed rule. This 3-year period will allow industry sufficient time to plan the acquisition and installation of this critical safety equipment. The following table summarizes the costs associated with this requirement.

Requirement	Total cost	Annual costs	Cost to small businesses
Proposed Rule—Install blind-shear rams within 1 year	\$14,000,000	\$14,000,000 over 1 year	\$0
Final Rule—Install blind-shear rams within 3 years	14,175,000	4,725,000 over 3 years	0

Avoidance of future blowout related costs, through the installation of blind-shear rams on all existing drilling rigs with surface BOP stacks, would constitute the potential benefits to lessees and their drilling contractors. In the analysis conducted for this rule, gross benefits are partially offset by the costs to purchase and install blind-shear rams, in surface BOP stacks that don't already have them. Our analysis indicates that implementation of the regulation will most likely result in net

present value benefits to lessees and drilling contractors of \$22 million. These benefits can be achieved by investing in the acquisition and installation of blind-shear rams for a present value cost of \$13 million. Accordingly, the present value of gross industry benefits from this regulation will most likely be \$35 million.

As discussed in the proposed rule, we believe that the final rule will not have a significant impact on small drilling contractors. It won't impact small

drilling contractors because there is only one that qualifies as a small business, and that contractor has already equipped its surface BOP stacks with blind-shear rams. The drilling contractor indicated that the blind-shear rams were installed as an additional safety precaution.

IADC also commented that MMS did not consider the consequences of the