gas or 8.7 to 9.3 percent methane. The air temperature is between 41 and 86 °F.

(2) Gallery test 10 is conducted in each trial with three sheathed explosive units placed in a row 2 feet apart. One of the trials is conducted with sheathed explosive units which have been subjected to the drop test as provided in paragraph (d)(3) of this section. The units are placed on a concrete slab, primed with test detonators and fired in air containing 3.8 to 4.2 percent natural gas, or 4.3 to 4.7 percent methane, mixed with 0.2 ounces per cubic foot of predispersed bituminous coal dust. The air temperature is between 41 and 86 °F.

(3) Gallery test 11 is conducted in each trial with three sheathed explosive units arranged in a triangular pattern with the units in contact with each other. The units are placed in a simulated crevice formed between two square concrete slabs, each measuring 24 inches on a side and 2 inches in thickness. The crevice is formed by placing one slab on top of the other and raising the edge of the upper slab at least 4 inches. The sheathed explosive units are primed with test detonators and fired in air containing 7.7 to 8.3 percent natural gas or 8.7 to 9.3 percent methane. The air temperature is between 41 and 86 °F.

(4) Gallery test 12 is conducted in each trial with three sheathed explosive units arranged in a triangular pattern with the units in contact with each other. The units are placed in a corner formed by three square steel plates, each measuring 24 inches on a side and one inch in thickness. The sheathed explosive units are primed with test detonators and fired in air containing 7.7 to 8.3 percent natural gas or 8.7 to 9.3 percent methane. The air temperature is between 41 and 86 °F.

(f) *Detonation test.* Each of ten sheathed explosive units shall propagate completely when fired at the minimum product firing temperature for the explosive used in the unit or 41 °F for units with explosives approved under regulations in effect prior to [insert the effective date of this rule]. The units are initiated with test detonators.

(g) *New technology.* MSHA may approve an explosive unit designed to be fired outside the confines of a borehole that incorporates technology for which the requirements of this subpart are not applicable if MSHA determines that such explosive unit is as safe as those which meet the requirements of this subpart.

§ 15.31 Tolerances for ingredients.

Tolerances established by the applicant for each ingredient in the sheath shall not exceed the tolerances specified in Table II § 15.21 of this part.

§ 15.32 Tolerances for weight of explosive, sheath, wrapper, and specific gravity.

(a) The weight of the explosive, the sheath, and the outer covering shall each be within ±7.5 percent of that specified in the approval.

(b) The ratio of the weight of the sheath to that of the explosive shall be within ±7.5 percent of that specified in the approval.

(c) The specific gravity of the explosive and sheath shall be within ±7.5 percent of that specified in the approval.

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Part III

Department of Labor

Mine Safety and Health Administration

30 CFR Part 75

Safety Standards for Explosives and Blasting; Final Rule

DEPARTMENT OF LABOR

Mine Safety and Health Administration

30 CFR Part 75

Safety Standards For Explosives And Blasting

AGENCY: Mine Safety and Health Administration, Labor.

ACTION: Final rule.

SUMMARY: This final rule revises the Mine Safety and Health Administration's (MSHA) existing safety standards for explosives and blasting in underground coal mines. The revisions update existing provisions consistent with current technology, eliminate duplicative and unnecessary standards, reorganize the existing standards and provide alternative methods of compliance where possible.

EFFECTIVE DATE: The final rule is effective January 17, 1989.

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SUPPLEMENTARY INFORMATION:

I. Background

The final rule revises the Mine Safety and Health Administration's existing safety standards for explosives and blasting in underground coal mines. These revisions are promulgated under section 101 of the Federal Mine Safety and Health Act of 1977 (Mine Act).

On May 8, 1984, MSHA published a notice in the **Federal Register** which announced the availability of its preproposal draft of explosive standards and scheduled public conferences to discuss it (49 FR 19601). Public conferences were held June 12, 1984, in Lexington, Kentucky, and June 14, 1984, in Pittsburgh, Pennsylvania. These conferences were well attended and MSHA received written comments from all segments of the coal mining community.

On May 9, 1986, MSHA published a proposed rule in the **Federal Register** (51 FR 17284). The proposal addressed the comments received regarding the preproposal draft. MSHA published a notice of public hearings in the **Federal Register** on October 21, 1986 (51 FR 37376). Hearings were held on November 18, 1986, in Pittsburgh, Pennsylvania, and November 20, 1986, in Lexington, Kentucky.

MSHA published a **Federal Register** notice (58 FR 9670) scheduling another hearing to receive additional testimony from interested parties concerning safety considerations when instantaneous and short-delay electric detonators are used in the same circuit. This hearing was held in Bruceton, Pennsylvania on April 22, 1987. The record remained open until May 15, 1987, to allow for the submission of post-hearing written comments and data on this issue. The record closed on December 19, 1986 for all other issues.

The Agency's final rule addresses the major comments received and is consistent with the goals of Executive Order 12291, the Regulatory Flexibility Act, the Paperwork Reduction Act and the Mine Act.

II. Discussion of the Final Rule

A. General Discussion

The use of explosives in underground coal mines presents a potentially serious risk of injury and death to miners. From 1978 through 1987 there were 41 fatalities resulting from the improper use of explosives. Additionally, during this period there were 312 nonfatal injuries in coal mines resulting from the improper use of explosives. Prevention of accidents involving explosives depends to a large extent on the knowledge and experience of persons in the mine responsible for using explosives, and adherence to the standards which guide mine operators and miners in the safe conduct of blasting operations.

The final rule addresses the need for knowledgeable and experienced personnel to perform blasting functions by requiring only "qualified persons" or persons working in the presence of and under the direction of a qualified person to use explosives underground. The final rule also updates MSHA's existing standards for explosives consistent with modern blasting practices and products. The final rule supplements existing standards where they currently do not address important aspects of blasting and deletes obsolete provisions.

Prevention of accidents with explosives is also dependent on the use of components especially designed to operate safely in an underground environment containing coal dust and methane gas. The final rule continues to require that explosives and blasting units used in underground coal mines be approved by MSHA. The regulations governing MSHA approval of explosives and sheathed explosive units are being published, in a separate rulemaking, simultaneously with this final rule. The Agency is also developing revisions to the approval requirements for blasting units. These revisions, which have been proposed as a subpart to 30 CFR Part 7, Product Testing by Applicant or Third Party, were made available for public comment in the **Federal Register** on June 22, 1988 (53 FR 23506). In addition, MSHA will seek to include in its regulatory program an approval schedule for detonators used in underground coal mines. As part of that rulemaking, changes would be made in this final rule to require the use of such approved detonators.

B. Section-by-Section Discussion

Section 75.1300 Definitions.

The practice of sequentially lettering general definitions in existing subparts, which was carried forward in the proposed rule, has been eliminated in this final rule. The former method was confusing to many commenters who questioned why the Subpart N revision of definitions began at letter "r". The final rule now contains definitions of terms specifically related to Subpart N arranged in alphabetical order.

Many commenters stated that the term "permissible", which was excluded in the proposed rule, has and continues to have widespread use and should be retained in the final rule. As a result, the final rule includes two definitions from the preproposal, "permissible blasting unit" and "permissible explosive."

The following definitions apply to Subpart N:

Approval. This term describes a written document issued by MSHA which states that an explosive or explosive unit has met the requirements of Part 15 and which authorizes an approval marking identifying the explosive or explosive unit as approved as permissible. This definition has been added to make Part 75, Subpart N consistent with Part 15.

Battery starting. This definition identifies a specific exclusion to the prohibition of firing shots outside a borehole and applies only to anthracite mines. A commenter objected to the use of unconfined shots in battery starting preferring to initiate the flow of coal down a breast or chute by other means, thereby reducing exposure of miners to unnecessary hazards. However, this procedure has been performed in anthracite mines for many years as long as methane was reduced to less than 1 percent. Because anthracite dust is not explosive, it does not present the same hazard as bituminous coal dust and the Agency has therefore retained the definition.

Blasting off the solid. This definition provides an explanation of a blasting technique which occurs without the provision of a kerf or second free face. The final rule is extended to include rock as well as coal blasting in response

to commenters who stated that it is not uncommon to encounter a rock fault across the full working face. While some commenters recommended prohibiting blasting off the solid stating that the practice is outdated and an unsafe method of mining, the Agency defines and regulates this practice under this final rule.

Instantaneous detonator. This definition describes a type of electric detonator that is commercially available for use in underground coal mines and which also has the performance characteristics for use with a sheathed explosive unit.

Laminated partition. This definition specifies the construction of the partition required to separate detonators from explosives when transported or stored. The definition remains unchanged from the proposed rule.

Opener hole. This definition describes the first borehole or holes fired in a ground when blasting off the solid to create an additional free face. This definition is essentially unchanged from the proposed rule.

Permissible blasting unit. This definition specifies a device which has been approved by MSHA for firing electric detonators. MSHA is in the process of revising the approval requirements for blasting units. The term "approved" that was used in the proposed Part 75, Subpart N definition is changed to "permissible" in response to comments. The proposed rule used the term "approved" instead of "permissible" to describe the explosive and blasting equipment required to be used by these provisions. The purpose of this was to standardize MSHA terminology used to describe mining products evaluated for safety by the Agency. Commenters objected, however, stating that this would result in confusion. In support of this, they noted that the term "permissible" has a long history of use in the explosives industry and that it also appears in State mining regulations. MSHA agrees that the term "permissible" is pervasively used in the industry worldwide to describe MSHA-approved explosives and blasting units. Upon reconsideration, MSHA retains the term "permissible blasting unit" in the final rule.

Permissible explosive. This definition specifies an explosive substance approved by MSHA for use in underground coal mines. As indicated above, the term "permissible" was used in the preproposal, but not retained in the proposal. Commenters urged that the term "permissible" be used instead of the term "approved." The final rule retains the term "permissible explosive."

Round. This definition describes a group of boreholes which are fired or intended to be fired in a continuous sequence by a single application of the firing current. One commenter suggested that the term "shots" in the proposed definition be changed to "holes" because this term is accepted and familiar in the industry. However, in the final rule, the term "shots" is changed to "boreholes." This term is more specific and is in keeping with the Agency's intent that regulations be as unambiguous as possible.

Sheathed explosive unit. This definition, as does the proposed definition, describes the unit as "a permissible explosive covered by a sheath of flame-inhibiting material encased in a sealed covering." Commenters stated that this terminology was too specific and would not provide for new technology. However, provisions are added to § 75.1315 to allow for the introduction of new technology. Accordingly, the definition is retained in the final rule to distinguish the units from other types of explosives.

Short-delay electric detonator. This definition specifies the range of delay periods for short-delay detonators that are commercially available for use in underground coal mines.

One commenter recommended that delay period numbers be included in the definition. However, delay period numbers corresponding to a given delay time may vary from manufacturer to manufacturer and thus not be uniform throughout the industry. Therefore, the Agency has not included delay period numbers in the definition.

Another commenter stated that the extension of the delay period beyond 500 milliseconds is not supported by established or promulgated regulations. However, research conducted by the Bureau of Mines, in conjunction with MSHA, has provided evidence that this time period can be extended to 1,000 milliseconds without increasing the risk of a methane or coal dust explosion. Accordingly, the definition is unchanged from the proposal. Comments concerning approved detonators are further discussed under § 75.1310(e).

Section 75.1301 Qualified person.

This standard revises the existing provision of 30 CFR Part 15 requiring explosives to be fired by "certified shot firers" and sets forth requirements for becoming qualified to perform this work.

MSHA statistics indicate that the persons most frequently injured in accidents with explosives are those firing the explosives. A frequent contributing factor has been the failure of these persons to follow safe blasting practices.

To address this risk to miner safety, the proposal included alternative qualification requirements for persons using explosives. Under the proposal, persons could have been qualified to use explosives if they were certified or qualified to do so by the State in which the mine was located, or if they had at least 1 year of underground coal mining experience and have demonstrated to an authorized representative of the Secretary the ability to properly use permissible explosives.

The final rule provides two alternatives for achieving qualification under this subpart. First, a person is a "qualified person" when the individual is certified or qualified to use explosives by the State in which the mine is located, provided that the State requires a demonstration of ability to safely use permissible explosives in accordance with Subpart N. This approach continues to recognize State qualification and certification programs for shot firers. However, under the final rule these programs will only be recognized if a demonstration of ability is included in the State program. This change from the proposal and existing standards recognizes evaluation of the individual's skill to safely use explosives to be the objective of the qualification requirement in the final rule.

Second, in States that do not certify or qualify persons to use explosives, a person is a "qualified person" if the individual has at least 1 year experience working underground on a coal-producing section of a mine where explosives are used and demonstrates to an authorized representative of the Secretary the ability to safely use explosives. Upon successful demonstration of this ability, MSHA's authorized representative will make application through the Qualification and Certification Unit in Denver, Colorado and a document indicating Federal qualification will be issued to the applicant. This aspect of the final rule provides for Federal qualification of persons to use explosives in underground coal mines. It addresses the need for a qualification program where none is available from the State in which the mine is located. The requirement is supported by MSHA accident data which shows that failure of the blaster to follow safe blasting practices or regulations was a contributing factor in over 80% of the fatal blasting accidents in underground coal mines from 1980 through 1986. In

addition, a Bureau of Mines evaluation of coal mine blasting accidents between 1978 and 1981 shows that the blaster was the person injured in 65% of the accidents.

The 1-year experience requirement was included in the proposal. However, the final rule specifies that such experience must be acquired while working on a coal-producing section where explosives are used. This change reflects the need for relevant experience that can be expected to provide the prospective qualified person with basic knowledge about the underground coal mining environment where explosives are used and the safety considerations uniquely involved in this work. To protect the safety of himself and others, the blaster must be capable of recognizing hazards associated with methane and roof and rib conditions in the working place. Additionally, the blaster must know the potential dangers from equipment and other mining activities in the immediate face area. He must also be experienced in face area development and mining techniques to ensure the safety of all section personnel during blasting.

One commenter expressed the opinion that State shot firer certification programs are inadequate and noted that training courses and written tests are required in other major mining countries. Other commenters stated that certain State programs such as those in Colorado and Virginia were effective and therefore should not be duplicated by the Federal Government. No comments from any State mining agencies were received on this issue. MSHA recognizes that State requirements for qualification or certification of persons to use explosives are not uniform. These programs, however, can provide appropriate systems for qualifying persons if certain necessary elements are met. The final rule, therefore, continues to recognize them, provided that a demonstration of ability to safely use permissible explosives in accordance with this subpart is included in the State program. The demonstration of ability requirement will provide a means of ensuring that each person is competent to use such explosives.

MSHA is aware that there are States which do not currently require this demonstration of ability in their qualification programs and, therefore, need time to address this issue. For this reason, paragraph (b) provides that persons qualified or certified by a State to use permissible explosives underground prior to May 17, 1989, that is, six months after publication, are considered qualified under § 75.1301 even though the State program did not contain a demonstration of ability requirement. During this six-month period, those States with programs which do not meet the requirements of this rule can take the necessary steps for a demonstration of ability provision in their programs. After the six months have elapsed, however, State programs without this provision will not be recognized by MSHA and persons qualified or certified under such programs will not be considered "qualified persons" for purpose of this rule.

For purposes of Federal qualification, other commenters suggested deletion of the coal mining experience requirement and retaining only a demonstration of ability requirement. These commenters indicated that if persons can demonstrate their ability, then experience is unnecessary. The commenters went on to note that, in the western United States, miners with extensive underground noncoal mining experience could be precluded from being qualified persons and that, as a result, some western coal mine operators might encounter difficulty finding miners with the required experience.

The conditions and hazards inherent in underground coal mining where explosives are used are different than most noncoal mines. The presence of methane gas and coal dust in the mining atmosphere presents hazards from ignitions and mine explosions not encountered in most other types of mines where explosives are used. For these reasons, the proposed coal mining experience requirement is retained in the final rule.

A commenter also recommended that MSHA continue to recognize State programs for qualifying persons to use explosives in underground coal mines, but not establish a new Federal requirement. This approach, however, was not adopted since it would not address the qualification of persons to work in mines in States with no qualification or certification program.

Section 75.1310 Explosives and blasting equipment.

This section of the final rule is derived from existing §§ 15.19(d), 75.1300 and 75.1303 except paragraph (d) which is new, and prescribes the types of explosives and blasting equipment that are permitted in underground coal mines. In addition, the section prohibits certain types of blasting materials from being taken or used in underground coal mines.

Paragraph (a) allows only permissible explosives, approved sheathed explosives units and permissible blasting units to be taken into or used in the underground areas of coal mines because of the potential explosive atmosphere. The final rule differs from the proposed rule in several respects. The proposal specified that explosives taken underground be approved under 30 CFR Part 15, Requirements for Approval of Explosives and Sheathed Explosive Units. It did not expressly recognize sheathed explosive units nor specify that only approved blasting units be taken underground. For clarity, the final rule identifies approved sheathed explosive units, which will be evaluated for use in mines by MSHA under revised Part 15, as being permitted in underground coal mines. In addition, it specifies that only permissible blasting units are to be taken or used underground.

Paragraph (b) lists those blasting items which are not permitted to be taken into or used in underground areas. These are black blasting powder, aluminum or aluminum-alloy-cased detonators with aluminum leg wires and safety fuses. Black blasting powder and safety fuses involve recognized fire and explosion hazards. Black blasting powder is highly deflagrating and does not have the flame-inhibiting characteristics required for approved explosives. The final rule identifies black blasting powder as a prohibited explosive in underground coal mines. This was not included in the proposal because only approved explosives, which do not include black blasting powder, were to be permitted underground. For clarity, however, the final rule retains the existing prohibition against the use of black blasting powder. A safety fuse, when ignited, produces a jet of flame that will ignite methane or float coal dust. Aluminum also presents a safety hazard because of its high incendivity. A coating of aluminum oxide can also form on the blasting wires and cause an increase in the electric contact resistance which can be the source of a misfire in a blasting circuit. Because of the mechanical properties of aluminum wire, splices can also loosen and reduce the contact between conductors.

Explosives, sheathed explosive units and blasting units must meet certain design and performance requirements to be approved for use in the potentially explosive atmosphere of underground coal mines. The materials prohibited by paragraph (b) do not meet these safety requirements and are known to present

a hazard if used in underground coal mines.

Some commenters requested that the proposed prohibition of nonelectric initiating systems be removed. While the final rule does not retain the proposed prohibition against nonelectric initiating devices, the definitions of instantaneous and short-delay detonators address only electric initiation systems. Commenters presented information which shows that new developments in explosive initiating systems indicate that alternate systems safe for use in underground coal mines may be developed in the foreseeable future. Presently MSHA has no criteria with which to evaluate nonelectric initiating systems. Until such time as standards are developed, the present petition for modification procedures are available to the mining industry. This process would require a case-by-case evaluation of nonelectric initiating systems to determine whether they perform as safely as the present performance of electric initiating devices.

Paragraph (c) requires that explosives be fired only with a permissible blasting unit used in a manner consistent with the blasting unit approval. This provision of the final rule replaces the proposed provision that explosives be fired only with an approved blasting unit that has sufficient capacity and is appropriate for the blasting operation.

MSHA recognizes that firing rounds containing a large number of boreholes is necessary under certain circumstances, such as when large amounts of rock need to be blasted. To address these conditions, blasting units designed to fire more than 20 boreholes, sometimes called large-capacity blasting units, have been tested and evaluated by the Agency under interim criteria and specifications and have been permitted to be used. The Agency's existing approval regulations for blasting units, 30 CFR Part 25, do not include specifications for the approval of such units. However, through the separate rulemaking of 30 CFR Part 7, Subpart D Blasting Units, MSHA has proposed new approval specifications that would recognize blasting units with the capacity to fire more than 20 boreholes in a round. Until these new approval regulations for blasting units are completed, blasting units evaluated under interim criteria by MSHA for safe use in underground coal mine atmospheres are considered to be approved for purposes of this regulation. Paragraph (c), therefore, requires that explosives be fired only with a permissible blasting unit used in a manner consistent with its approval.

Those blasting units that are approved by MSHA to fire only short-delay electric detonators will still continue to be permissible under this final rule. The Agency intends to allow these units to be used when firing instantaneous and short-delay detonators up to 1,000 milliseconds in bituminous mines, and also long period delay detonators in anthracite mines since there is no safety hazard apparent in using blasting units with either of these detonators. Research conducted by the Bureau of Mines in developing criteria for sheathed units and evaluating delay periods for detonators has demonstrated that permissible blasting units approved under Part 25 can be used safely with instantaneous, short- and long-delay detonators.

The primary purpose of using approved blasting units is to minimize the risk of igniting methane gas released by blasting or igniting coal dust placed into suspension by the forces created by the detonation of explosives. While this hazard is greater in the face area and in return air courses, it is also present in other areas of the mine when explosives are fired. As noted in the proposal, in 1970 a coal dust explosion occurred in an area outby the face and 38 miners were killed. While this accident may not have been caused by the failure to use an approved blasting unit, it does demonstrate that the potential exists for an ignition of coal dust or methane in areas of the mine other than inby the last open crosscut or in return air courses. For this reason, the final rule retains the principle of the existing standards that only blasting units approved as permissible are permitted in underground coal mines.

A commenter questioned the proposed requirement that the blasting unit used be "appropriate for the blasting operation". The purpose of this provision was to require that the capacity and function of the blasting unit be matched with the blasting to be performed. This purpose is addressed by the final rule which requires that a permissible blasting unit be "used in a manner consistent with its approval". Thus, if a blasting unit is approved to initiate up to 20 boreholes per round, it must not be used to initiate more than 20 boreholes in a round.

Paragraph (d) prohibits the use of permissible explosives and sheathed explosive units underground when they are below the minimum product firing temperature specified by the approval. The minimum product firing temperature for permissible explosives and sheathed explosive units are part of the approval issued for such explosives and sheathed units under Part 15. As explained in the proposal, the product temperature at which an explosive or sheathed unit is used directly affects its safe performance. Additional discussion of this issue can be found in the new explosives approval regulations.

Several commenters noted that the minimum product firing temperatures for approved explosives are not presently available. Previous MSHA regulations for the approval of explosives did not address a minimum product firing temperature. In Part 15, the final rule for the approval of explosives and sheathed explosive units requires the manufacturer to designate and display the minimum product firing temperature on the approval label. Under this final rule, explosives and sheathed units must not be fired when the product is below the temperature appearing on the approval label. MSHA will continue to allow the use of previously approved explosives recommending that they be fired in accordance with the manufacturer's recommended product temperature.

Paragraph (e) requires that electric detonators be compatible with the blasting unit and have sufficient strength to initiate the explosive being used. When operated, permissible blasting units provide a short burst of electric current within certain specifications. Factors that influence the performance of these units in conjunction with permissible explosives include the resistance created by the detonators to be fired and the energy necessary to initiate them. For example, detonators requiring more than 2 amperes to reliably initiate them may result in misfires when used with permissible blasting units. Likewise, some imported detonators of less than No. 8 strength may not reliably fire certain types of permissible explosives. MSHA is aware of detonators, introduced into the U.S. market and advertised as suitable for use in gassy mines, which require an initiating current exceeding the tested capacity of blasting units approved under 30 CFR Part 25. Further, Bureau of Mines tests of other imported detonators entering the U.S. market show reduced minimum no-fire currents. Uncontrolled minimum no-fire currents could lead to detonation of explosives during circuit testing, or greater sensitivity to stray electrical currents. These are examples of detonators which would be incompatible with the blasting unit and therefore not allowed under this provision.

Under the preproposal draft, the issue of detonator compatibility was to be primarily addressed by new MSHA approval regulations for detonators. The proposal did not retain this approach, except that it would have required blasting units to "have sufficient capacity and be appropriate for the blasting operation". Since the proposed rule was published, MSHA has become aware of new detonators on the market which may not have the same characteristics as those previously available. Therefore, MSHA will seek to include an approval schedule for detonators used in underground coal mines in its regulatory program.

Section 75.1311 Transporting explosives and detonators.

This standard is derived from existing §§ 75.1301, 75.1304, 75.1305 and 75.1403–7 except § 75.1311(b)(2). This section specifies the requirements for transporting explosives and detonators underground. The hazards addressed by these standards are damage to explosives and detonators and accidental detonations. The final rule maintains the approach used in the proposal by specifying requirements for particular methods of transportation.

The final rule also adopts the suggestions of a commenter who recommended that the new standards should distinguish between track-mounted and other types of vehicles. The final rule distinguishes requirements for cars or vehicles and trolley locomotives based on the unique hazards which are presented by each mode of transportation. The final rule separately addresses the transportation of explosives and detonators by hand.

Paragraph (a) sets forth general requirements for transporting explosives and detonators underground, regardless of the transportation method. As in the proposal, the final rule requires that explosives and detonators be enclosed in separate, substantially constructed containers made of nonconductive material, with no metal or other conductive material exposed inside. It further clarifies that both Class A and Class C detonators in quantities greater than 1,000 be maintained in the original containers as shipped from the manufacturer to gain additional protection against accidental initiation. This is consistent with Department of Transportation (DOT) requirements for transporting explosives and detonators unless they are transported in separate vehicles. This provision reduces the risk of damage or spillage. Transporting explosives and detonators in separate containers segregates the initiating devices from the explosives, thus providing protection against accidental detonation of the explosives by the detonators. Substantially constructed, nonconductive containers protect explosives and detonators from electric current and damage or spillage during transportation. Typically, original containers for explosives are heavy grade cardboard with a water-repellant finish. When closed and in good condition, these containers adequately protect the contents. Likewise, the original packaging for detonators is nonconductive and holds the product in a stable, protected fashion suitable for transportation underground.

Paragraph (a) also requires that each container of explosives and detonators be indelibly marked with a readily visible warning identifying the contents. This final rule differs from the proposal which required only that the container be marked with a warning identifying the contents as explosive.

One commenter noted that the proposal might have allowed a person to print a warning with chalk and suggested that reflective lettering at least 6-inches high be required. The final rule provides that the warning must be "readily visible". This means that the warning must be easily seen by those people who work in the vicinity of the containers so as to alert them to the presence and contents of the containers. With this approach, the final rule permits the use of any effective method that informs approaching miners of the presence of explosives and detonators. In the final rule "indelibly" marked is added in response to this comment. "Indelibly marked" does not allow the use of chalk or any writing material which could be smeared, erased, or susceptible to change from the mine environment.

Paragraph (b) of the final rule applies when explosives and detonators are transported by any type of cars or vehicles. The cars or vehicles must be marked with warnings identifying the contents as explosive. The warning must be visible for miners approaching from any direction and be written in indelible letters. This warning can be in the form of removable signs. The final rule remains substantially the same as the proposal. The term "vehicle" is added to the final rule to clarify that these standards apply to any type of explosives and transportation equipment used underground. Because a car or vehicle can change direction or be approached from various sides and directions, the final rule essentially includes the preproposal provision in specifying that the warning be readily visible to miners approaching from any direction.

Several commenters suggested that the final rule include a new requirement that containers carrying explosives and detonators be situated in vehicles and cars so that they do not extend beyond the profile of the vehicle. While such a provision would limit the possibilities of damage and spillage if a container were to strike the roof or a rib, MSHA has concluded that such a requirement is unnecessary. The Agency's evaluation of explosive-related transportation accidents in underground coal mines did not indicate that any of these accidents were caused by the containers of explosives or detonators extending beyond the profile of the vehicle.

Paragraph (b) also addresses requirements for transporting detonators with explosives. It requires that explosives and detonators be transported in separate cars or vehicles. As an alternative, explosives and detonators may be transported in the same car or vehicle, provided that both Class A and Class C detonators in quantities greater than 1,000 are kept in the original containers as shipped from the manufacturer and separated from explosives by a hardwood partition of at least 4 inches thick, a laminated partition or equivalent. Additional protection must be provided when transporting these types and quantities of detonators with explosives. The experience of the Institute of Makers of Explosives (IME) has also shown that all Class A and Class C electric detonators may be shipped with prescribed packaging requirements and quantities in an IME 22 container. This container provides protection which is consistent with the hardwood or laminated partition prescribed in this rule. The IME publication entitled "Guide for the Use of IME 22 Container", April, 1988, provides information related to packaging and container shipment of detonators. Both Class A and Class C detonators may be transported in quantities of no more than 1,000 in the same vehicle with explosives if separated by 4 inches of hardwood, a laminated partition or equivalent. The principal purpose behind separating explosives and detonators during transportation is to minimize the danger of detonating the explosives in the event the detonators are accidentally initiated. The final rule further clarifies explosives transportation requirements in the proposal by requiring additional protection when certain detonators are transported with explosives. This final rule provision is consistent with IME guidelines and DOT regulations.

In response to several comments to the preproposal, the definition of "laminated partition" was revised in the proposed rule to specify minimum nominal dimensions for a laminated barrier rather than exact dimensions. The definition was derived from the Institute of Makers of Explosives, Pamphlet Number 22, January 1, 1985. The final definition is the same as the proposal.

Paragraph (b)(3) prohibits persons, other than those necessary to operate the equipment or to accompany the explosives and detonators, from being transported with the explosives and detonators. This provision is the same as the proposal and provides for a minimum number of miners to be exposed to a potentially hazardous situation.

Several commenters recommended that the final rule distinguish between track-mounted vehicles used for transportation of explosives and detonators and other types of vehicles used for this purpose. In response to these comments, and recognizing that certain track-mounted vehicles carrying explosives and detonators can involve hazards such as sparks from an arcing trolley wire which are not present with other types of vehicles, the use of trolley locomotives is separately addressed in paragraph (b)(4).

The final rule revises and makes mandatory the existing safeguard criterion in § 75.1403–7(i). It requires that trips carrying explosives and detonators be separated by at least a 5-minute interval from mantrips. Although not included in the proposed rule, a similar provision requiring a 5-minute interval was included in the preproposal draft. One commenter objected that the provision was not in the proposed rule. Based on the Agency's experience with the existing criterion, the 5-minute interval is an effective safety measure. This precaution reduces the chance of any collision with other track haulage equipment when explosives or detonators are being transported. Should a collision occur causing the detonation of transported explosives, the entire mine is in jeopardy of a propagating coal dust explosion. A review of MSHA accident data shows a high frequency of track haulage accidents underground. This information coupled with the hazards of transporting explosives and detonators, has caused MSHA, upon reconsideration, to adopt the 5-minute interval but limits the application to mantrips rather than all trips as specified in the preproposal. No commenters on the preproposal opposed its inclusion. The final rule deletes the existing criteria provision contained in § 75.1403–7(i) and makes the 5-minute interval mandatory for all mantrips.

The final rule also requires that when trolley locomotives are used, the cars containing explosives and detonators must be separated from the locomotive by at least one car that is either empty or that only contains noncombustible materials. This standard was included in the preproposal, but not in the proposal draft. It addresses the danger of an accident or a sudden stop during which the explosives or detonators could, unless adequately separated from the locomotive, come into contact with the heat or electricity generated by the locomotive, possibly resulting in an explosion.

Paragraph (c) sets forth requirements for transporting explosives and detonators on conveyor belts. These standards require explosives and detonators to be kept separated to avoid an accident with one from involving the other. The final rule also addresses the hazard of damaging and spilling explosives and detonators when using belt conveyors for transportation. One commenter suggested that in mines where there is a means of transporting explosives and detonators other than conveyor belts, the final rule should require the other method to be used. In MSHA's experience, tranportation of explosives and detonators by conveyor belt is safe, provided that the precautions prescribed by the rule are followed. When dangerous circumstances have been created during transportation of explosives and detonators by conveyor belt, they have been the result of collisions with obstructions or unsafe handling practices at transfer points or when unloading.

Like the proposal, paragraph (c)(1) provides that at least 6 inches of clearance must be maintained between the top of any container of detonators or explosives and the mine roof, or other obstruction along the conveyor belt. A commenter suggested that a minimum of 18 inches of clearance be required to be maintained between the top of containers of explosives and detonators and the mine roof or other obstruction. The final rule requires 6 inches of clearance instead of 18 inches because the required clearance is both adequate and reasonable to protect against damage to or spilage of explosives and detonators. It also accounts for vertical movement of the containers at uneven locations along a beltline, while recognizing the confined nature of the underground environment.

Except when persons are riding the belt to accompany explosives or detonators, a person must be at each transfer point between belts and the unloading location. This exception has been retained from the proposal recognizing that these persons would be in a position to stop the belts at these transfer and unloading points. Conveyor belts are also required to be stopped before explosives or detonators are loaded or unloaded. This new provision has been added to the final rule in response to a comment and is based on MSHA's assessment of several hazards associated with working around moving conveyor belts. An MSHA study, presented at the Fourteenth Annual Institute on Coal Mining Health and Safety at Blacksburg Virginia in 1983, on transportation and materials handling during the period from 1975 to 1982 showed 50 persons of all accidents associated with handling materials in underground coal mines to be conveyor related. Stopping the belt before loading or unloading allows stable positioning of cartons thereby reducing the potential of explosives and/or detonators from being carried over a belt tailpiece causing damage or detonation. It also protects against the hazard of miners being pulled into the moving belt during the course of handling containers.

Paragraph (d) addresses transportation of explosives and detonators by hand. It requires that they be carried in separate, nonconductive containers to keep explosives from coming in contact with initiating devices and to protect explosives and detonators from external electric sources. The original containers, rubberized bags or other nonconductive containers may be used to comply with this provision. The use of rubberized bags when transporting explosives and detonators by hand has proven to be safe.

The provision addressing hand-carried explosives and detonators was inadvertently left out of the proposal. MSHA recognizes that hand-carrying is likely to be used at some point when transporting explosives and detonators to the place of use. Therefore, this provision has been added to the final rule.

Section 75.1312 Explosives and detonators in underground magazines.

The final rule is derived from existing § 15.19(b) and §§ 75.1301, 75.1306 and 75.1307, except for paragraphs (c), (f) and (g) which are new. The rule establishes basic requirements for explosives and detonators kept in underground magazines and places

limits on the quantity of explosives permitted underground.

Paragraph (a), like the existing rule, limits the quantity of explosives kept in underground magazines to no more than is needed for 48 hours of use. This quantity limit, which remains unchanged from the proposed rule, will vary at each mine according to the amount of explosives used in the operation. Limiting the amount of explosives underground protects against a large quantity of explosives being involved in a mine fire or explosion.

One commenter recommended a limit on both the quantity and time during which explosives may be stored, suggesting that only amounts needed and used within a 24-hour time period be permitted. Other commenters expressed concern that the proposed 48-hour period could lead to enforcement problems since usage may vary at a particular mine for any 48-hour time period, particularly for an operator who does not use explosives for the extraction of coal. One commenter recommended eliminating this requirement and suggested using instead a standard which addresses removal of deteriorated explosives from the mine. This commenter expressed the view that manufacturers have achieved a safe level of product stability and that the 48-hour standard would not address the hazards associated with excessive quantities of explosives stored underground. Another commenter stated that a 48-hour supply rule would be too restrictive, leading to increased handling and miner exposure to hazards transporting explosives. This commenter recommended a 7-day storage supply limitation.

The final rule limits the quantity of explosives kept underground to that amount expected to be used within 48 hours. Some commenters were confused at the public hearing as to the meaning of the quantity limit. MSHA emphasizes that the 48-hour rule is not a time limit for storage underground which requires that explosives be removed after 48 hours. Instead, it is a quantity limit on the volume of explosives stored underground, the quantity being that amount which would normally be used in the operation over 48 hours. To avoid unnecessary handling of explosives, MSHA has interpreted the existing standard in this manner and it has been industry practice for more than 30 years.

Paragraph (b) requires that explosives and detonators taken underground be kept in separate closed magazines at least 5 feet apart, or in the same closed magazine with the explosives and detonators separated by a hardwood partition at least 4 inches thick, separated by a laminated partition or equivalent. This standard remains basically unchanged from the proposed rule and addresses the need for careful storage of explosives and detonators as a basic precaution against damage and accidental detonation. Keeping explosives and detonators in either separate closed magazines or in the same closed magazine with the explosives and detonators separated by at least a 4-inch hardwood partition, a laminated partition or the equivalent minimizes the potential detonation of explosives in the event that the detonators are accidentally initiated.

Paragraph (c) requires that only explosives and detonators be kept in underground magazines and is substantially unchanged from the proposal. The proposed phrase "stored underground" is revised to read "kept underground" to clarify that explosive and detonator supplies be limited as prescribed by paragraph (a) of this section. Under the final rule, no materials other than explosives and detonators are to be kept in underground magazines. This standard prohibits the accumulation of empty packing material, combustible material and other items which could contribute to a fire or accidental detonation.

Paragraph (d) also remains unchanged from the proposed rule. It requires that magazines be substantially constructed and all interior surfaces be made of nonconductive material with no metal or other conductive material exposed inside. MSHA recognizes that metal exteriors have been effectively used to protect stored explosives and detonators from accidental detonation and damage. This rule permits the use of mobile magazines as well, provided that they meet the requirements of the final rule. A commenter also suggested that a provision be added to the final rule which would require all magazines to be immobilized while containing explosives. The commenter stated that all magazines must be stationary and in a known location outby the face to avoid the potential of equipment accidentally damaging a mobile magazine because of its unknown location. As discussed below, magazine locations are required to be posted with readily visible warnings to provide adequate notice of the location of explosives. These warnings on the magazine alert miners when magazines are moved to a new location. MSHA is not aware of any accidents regarding explosives and detonators in mobile magazines resulting from the magazine being either hit and damaged by mining equipment or by the magazine itself becoming a runaway piece of equipment. Most magazines are of skid-mounted type and are portable rather than mobile. Therefore, this recommendation is not adopted in the final rule.

Paragraph (e), which is consistent with both the proposal and the existing standard, requires that magazines be at least 25 feet from roadways and any source of electric current. Magazines must also be out of the direct line of the forces from blasting and be kept as dry as practicable.

One commenter suggested that all magazines be located at least 150 feet outby the last open crosscut. This suggestion has not been adopted. In MSHA's experience, the precautions of paragraph (e) provide a necessary and reasonable measure of protection against the hazards of an accidental explosion or other hazards involving explosives and detonators in magazines Locating the magazine 25 feet from any roadway will keep it out of areas of concentrated mine traffic where the magazine might be struck by equipment Keeping the magazine out of the direct line of the force of blasting protects the explosives supply from being damaged or accidentally initiated. When the magazine is kept as dry as practicable, damage to or deterioration of the explosives and detonators while they are stored in the magazine is minimized

Paragraph (f) requires that magazine locations be posted with indelibly marked, readily visible warnings indicating the presence of explosives. One commenter recommended that the warning be made of reflective material with lettering at least 6 inches tall and that these signs be located at all points where persons entering the area would pass. The warnings required by the fina rule must be indelible and sufficiently marked in a fashion that is readily visible, indicating the location of a magazine. This will require warnings that alert persons entering the area of the contents in the magazine, which is the purpose of this standard. The particular method by which this is accomplished, however is not specified in the final rule. Instead, the mine operator can determine how to appropriately label the warning signs.

Paragraph (g) specifies that only materials and equipment used in blasting such as blasting units, blasting cable, and tamping sticks can be stored at magazine locations. This is unchanged from the proposed rule. This provision differs from paragraph (c) in that it limits the items that can be stored in areas surrounding magazine locations while paragraph (c) limits the materials that can be stored inside an

underground magazine. Paragraph (g) does not permit the storage of combustible material or empty packaging at these locations. This will minimize the risk of fire and premature initiation of the explosives and detonators.

One commenter suggested that underground storage of explosives and detonators be prohibited in any mine that does not use explosives to produce coal on a regular basis. The commenter stated that this would eliminate deterioration of explosives and detonators when stored for a long period of time. When explosives and detonators are stored in accordance with the final rule, the incidence of deterioration will be minimized. However, when deterioration of the explosives and detonators does occur, the final rule specifies that they be removed from the mine. In addition, the Agency is not aware of any data which indicates that problems are being encountered in underground coal mines as a result of this practice. For these reasons, this suggestion is not adopted in the final rule.

Section 75.1313 Explosives and detonators outside of magazine.

The standards in this section are derived from existing §§ 75.1301, 75.1304, 75.1306 and 75.1307 except for paragraphs (a) and (c) which are new. They address the handling of explosives and detonators that are removed from magazines for use. These standards are not changed substantially from the proposed rule except for paragraph (a) which, although not in the proposal, was a new provision in the preproposal draft.

Paragraph (a) is a new requirement which limits the quantity of explosives that can be outside a magazine for use in a working section or other area where blasting is to be performed to 100 pounds except when more than 100 pounds of explosives are required to blast one round. In the latter situation, the amount necessary to blast one round may be outside of the magazine. These limitations were in the preproposal draft but were not included in the proposal. At least 10 fatalities have occurred where explosives being stored on mining equipment accidentally detonated when the coal face was blasted. Upon reconsideration of this accident data and in response to a comment urging that a limitation on the amount of explosives outside a magazine be specified, this provision has been added to the final rule.

In addition, when excessive quantities of explosives are outside of a magazine they are subject to being misplaced and run over by mining equipment. This limitation will protect against accumulation of explosives on a working section or other area of a mine. This will also lessen the severity of an accident involving premature detonation of explosives.

The 100-pound limitation is based on the fact that explosives are normally stored in 50-pound cases. An allowance of 100 pounds of explosives outside of a magazine is more than enough to blast a round of coal. In certain instances, such as when blasting rock overcasts, MSHA recognizes that more than 100 pounds of explosives may be necessary. Paragraph (a)(2) of this section allows an operator the needed flexibility to do blasting under those special circumstances.

Paragraph (b) requires that explosives and detonators outside a magazine that are not being transported or prepared for loading in boreholes be kept in closed separate containers made of nonconductive material with no metal or other conductive material exposed inside. The containers must be at least 15 feet from any source of electrical current, out of the direct line of the forces from blasting, in a location to prevent damage by mobile equipment, and kept as dry as practicable. This paragraph is unchanged from the proposed rule.

One commenter suggested deleting the requirement that explosives and detonators be kept as dry as practicable because virtually all explosives and detonators are water resistant. Water gel and emulsion type explosives are wrapped in plastic and may not be affected by water. However, some granular-type explosives are wrapped in paper cartridges which are subject to water deterioration.

The 15-foot distance which must be maintained between the explosives and detonators and any source of electric current has proven to be an effective distance in preventing accidental initiation. Keeping the detonators and explosives out of the direct line of the forces from blasting normally means keeping these materials out of the section or area where blasting is conducted. When the explosives or detonators are kept in a location to prevent damage by mobile equipment, the possibility of accidental contact which could initiate detonation is lessened.

Paragraph (c) is a new provision which requires that explosives and detonators not used during the shift be returned to a magazine by the end of the shift. This paragraph is unchanged from the proposed rule. One commenter suggested that MSHA clarify that the provision allows storage in a section magazine at the end of a shift and does not require that explosives and detonators be carried outside of the mine to the main magazine at the end of a shift. MSHA does not believe that any additionally clarification is needed. The regulation permits the operator to use either the section or the main magazine so long as it meets the requirements of these standards.

A commenter recommended that MSHA require only qualified persons to return unused explosives to a magazine at the end of the shift. MSHA has not adopted this recommendation because the primary concern addressed by the qualified person requirement is the safe use of permissible explosives. These type explosives are required to be kept in substantially constructed, enclosed containers until used and pose limited hazards to persons handling these containers. Consequently, a qualified person is not required for transporting explosives into or out of the mine or for removing explosives from a magazine. The Agency believes, that since similar circumstances exist when returning explosives to a magazine, the need for a qualified person to perform this task does not exist.

Section 75.1314 Sheathed explosive units.

This new section sets forth the conditions under which sheathed explosive units may be used in underground coal mines. Other general requirements in the final rule for transportation, storage and handling of explosives also apply to the sheathed explosive units. The sheathed explosive unit, which was developed by the Bureau of Mines, U.S. Department of the Interior, can be fired outside the confines of a borehole without presenting the hazard of igniting any flammable atmosphere which might be present underground. Existing standards currently prohibit the firing of any explosives in bituminous coal mines that are not confined in a borehole. Sections 75.1310 and 75.1315 of the final rule allow the use of sheathed explosive units and § 75.1314 sets forth requirements for their use. Situations where it may be advantageous from a safety standpoint to fire the sheathed explosive unit include dislodging loose roof slabs or coal or rock overhangs, roof fall leveling, and slab or boulder breaking.

One commenter recommended that the use of sheathed explosive units be prohibited. This commenter stated that permitting the use of sheathed units would allow unconfined shots to be fired in underground bituminous coal

mines resulting in a diminution of safety for the miners. Historically, the firing of unconfined shots has been prohibited. The sheathed explosive unit is designed to form a flame-inhibiting cloud upon firing of the unit. This cloud will prevent the flame created by firing of the explosive from igniting any explosive mixtures that may be present. The Bureau of Mines conducted numerous tests on its prototype sheathed explosive units to determine whether they would ignite explosive mixtures of methane or coal dust. During these tests the units were placed in a gallery containing explosive mixtures and fired. The firing of these units did not ignite any of the explosive mixtures. The tests conducted by the Bureau of Mines clearly show that sheathed explosive units can be used safely in underground coal mines, provided that the applicable provisions of this final rule are followed.

In addition, MSHA is issuing, concurrently with this final rule, approval requirements for sheathed explosive units. As previously discussed, sheathed explosive units must be approved by MSHA before they can be used in underground coal mines. These approval requirements are included in the revisions to 30 CFR Part 15.

Paragraph (a) of the final rule specifies that an instantaneous detonator must be used to fire each sheathed explosive unit. This paragraph remains essentially unchanged from the proposal, except the term "each" has been added to clarify that each sheathed explosive unit must be initiated by a separate instantaneous detonator for firing. The exclusive use of instantaneous detonators with sheathed explosive units protects against the hazards associated with sheathed explosive units being damaged by the earlier firing of an adjacent unit.

One commenter stated that short-delay detonators with the same delay periods could be used because the identical delays would ensure that the blast is essentially instantaneous. Tests conducted by the Bureau of Mines on short-delay detonators indicate that firing times for the same delay period can vary significantly. For example, a short-delay detonator with a designated delay period of 100 milliseconds could detonate in a time period ranging from 75 to 125 milliseconds. Therefore, if short-delay detonators are used in sheathed explosive units, one unit could fire before the others, thereby causing damage to the flame-inhibiting sheaths of adjacent units, and resulting in an ignition of coal dust or methane. Because of this potentially hazardous situation, the final rule specifies that instantaneous detonators be used when firing sheathed explosive units.

Paragraph (b) requires that a qualified person or a person working in the presence of and under the direction of a qualified person must prime and place the sheathed explosive units into position for firing. This paragraph also specifies that when priming a sheathed explosive unit the entire detonator must be inserted into the detonator well of the unit and be secured in place. Correct priming and placement of sheathed explosive units, like all other explosives, are crucial to safe performance. The final rule clarifies the proposal which specified that a person be under the immediate supervision of a qualified person. Under the final rule, when the sheathed explosive units are primed and placed by other than a qualified person, it must be done in the immediate presence of and under the direction of a qualified person.

The requirement in paragraph (b) regarding the method for priming the sheathed explosive unit appeared in the preproposal draft but not the proposed rule. Upon reconsideration, MSHA believes that because the sheathed explosive unit is relatively new, a requirement for how it is to be primed is necessary to reduce the hazards associated with improper detonator placement. Placing the detonator in the detonator well of the sheathed explosive unit initiates the explosive in the unit without damaging the sheath. Detonators improperly placed, could only partially detonate the explosive and damage the flame-inhibiting sheath. Damage to the flame-inhibiting sheath might then allow the explosive to ignite gas or dust in the mine atmosphere. The final rule also requires detonators to be secured in place to prevent movement of the detonator prior to initiation.

Paragraph (c) requires that sheathed explosive units not be primed until immediately before the units are placed where they will be fired. This paragraph is unchanged from the proposal. It addresses the hazard of prime sheathed explosive units being exposed in the underground mine environment for extended periods of time without being used, increasing the likelihood of accidental detonation. The priming of the sheathed explosive units is the last step in preparation of the explosives before the units are placed where they will be fired. The final rule minimizes the amount of time an explosive remains primed prior to firing.

Paragraph (c) requires that a sheathed explosive unit not be primed if it is damaged or deteriorated. The final rule revises the proposal which specified that a sheathed explosive unit not be fired if it is damaged or deteriorated. The final rule does not permit damaged or deteriorated sheathed explosive units to be primed. A qualified person will be able to visually inspect the sheathed explosive units before preparing them for detonation to determine if a sheathed explosive unit is damaged or deteriorated. Damaged or deteriorated sheathed units increase the potential for a misfire.

Paragraph (d) requires that rock dust be applied to the roof, ribs and floor within a 40-foot radius of the location where the sheathed explosive units are to be fired except in anthracite mines. This paragraph appeared in the preproposal draft but not the proposed rule. This application of rock dust helps protect against the hazards of float coal dust and coal dust being placed into suspension when the sheathed explosive unit is fired. In addition, it ensures that rock dust is applied in areas which are not covered by the MSHA requirement that generally addresses rock dust applications (30 CFR 75.402).

Paragraph (e) of the final rule provides that no more than three sheathed explosive units be fired at one time. This paragraph remains unchanged from the proposal. The use of three sheathed explosive units at one time should be adequate for application in underground coal mines. The simultaneous firing of three units is the maximum number of units that have been tested by the Bureau of Mines in an explosive atmosphere. These tests have shown that the proper firing of three units does not create an ignition hazard. One commenter, who had observed testing of sheathed explosive units by the Bureau of Mines, stated that in his opinion, three units provided ample rock breaking capacity to break the strongest strata associated with roof falls and excavation.

Paragraph (f) requires, as did the proposal, that sheathed explosive units not be fired if they are in contact with another sheathed explosive unit. This is in accordance with the test procedures used by the Bureau of Mines to determine the safety of firing sheathed explosive units. In addition, this will minimize the possibility that the concussion created by the firing of a unit will damage the flame inhibiting sheath of an adjacent unit and adversely affect the safety aspects of its performance.

Several commenters suggested that the term "sheathed explosive unit" be replaced with the phrase "explosives approved for unconfined blasting". They stated that the term "sheathed explosive

unit" may limit technological advances and prevent the use of devices that are as safe as sheathed explosive units. The term "sheathed explosive units" is used in the final rule primarily to distinguish them from other types of explosives and should not be interpreted as limiting the introduction of other devices designed to be fired outside of boreholes. The approval provisions in Part 15 and the requirements of § 75.1315 allow for the future introduction of other such explosive units approved by MSHA.

Section 75.1315 Boreholes for explosives.

This standard is derived from existing §§ 75.1300, 75.1302, and Part 15 except for paragraphs (d), (e), and (f) which are new. It addresses unconfined shots and the use, spacing and maintenance of boreholes. These requirements will minimize the occurrence of gas and coal dust explosions and misfires.

Paragraph (a) requires that all explosives fired in underground coal mines be confined in boreholes except sheathed explosive units and other explosive units approved by MSHA for firing outside the confines of a borehole and shots fired in anthracite mines for battery starting or blasting coal overhangs. The final rule revises the existing requirement by allowing the use of sheathed units and deleting the terms "mud caps and adobes". Unconfined shots continue to be prohibited by the requirement that explosives fired underground be confined in boreholes, except when firing sheathed explosive units or other explosive units approved by MSHA under Part 15.

When explosives are fired, they create sufficient flames to ignite coal dust and methane. However, if the explosives are stemmed in a borehole, the flame is confined in the borehole and cannot ignite any coal dust or methane that may be present. This same principle is true for sheathed explosive units which upon firing create a cloud of flame-inhibiting material and prevent the flames from causing an ignition.

One commenter recommended that battery starting in anthracite mines be accomplished with means other than the use of unconfined blasting to prevent exposing miners to unnecessary hazards. The final rule allows unconfined shots to be fired in underground anthracite mines for battery starting and when taking down coal overhangs. These practices have been performed in anthracite mines for many years. Unlike bituminous coal dust, anthracite coal dust is not explosive and therefore does not present the same hazard as bituminous coal dust. However, as with all blasting, § 75.1324 prohibits any round from being fired unless the methane concentration in the area is less than 1 percent volume.

The final rule also prohibits persons from going inside a battery to start the flow of material. This requirement, which is an existing provision, was inadvertently omitted from the proposed rule. The Agency believes that due to the severe hazard of being struck and or crushed by falling material which is associated with this practice, it must be specifically prohibited.

Paragraph (b) requires boreholes for explosives in coal to have a distance of at least 24 inches between the boreholes and between each borehole and any free face, unless the height of the coal seam does not permit such spacing. This revises the existing standard which requires a burden of 18 inches in all directions. MSHA's experience, as well as that of several commenters, has shown that this language is subject to a variety of interpretations and leads to confusion. Therefore, the phrase "burden * * * in all directions", as used in existing Part 15, is deleted in the final rule.

Research conducted by the Bureau of Mines has indicated that, in order to minimize the potential for desensitization of explosives being fired in coal, a minimum spacing of 24 inches is necessary. The shockwaves created by the firing of explosives in a borehole can compress the explosives in an adjacent borehole if the spacing is less than 24 inches. When explosives are compressed, their density is changed and the likelihood of a misfire is significantly increased. Results of research conducted by the Bureau of Mines indicates that misfires occur approximately 50 percent of the time when the separation between boreholes is only 18 inches. The occurrence of misfires was significantly reduced when the spacing between the boreholes was increased to 24 inches.

Several commenters stated that a 24-inch spacing of boreholes would be too great a distance when blasting rock in combination with coal (middle man). They stated that such spacings would result in oversized rocks and reduce the overall effectiveness of the shot. Some of these commenters recommended that the existing 18-inch spacing be retained, while others recommended that a provision be added which would allow District Managers to permit distances less than 24 inches.

Paragraph (c) has been added to the final rule to address the concerns of these commenters. It requires boreholes in rock to be at least 18 inches from any other borehole in rock, at least 24 inches from any borehole in coal, and at least 18 inchres from any free face. This recognizes that rock is a harder material than coal and the distance between boreholes necessary to prevent desensitization of explosives is less. However, when a combination of rock and coal are blasted simultaneously, any borehole in rock must be at least 24 inches from any borehole in coal.

Paragraph (d) prohibits a borehole that has at any time contained explosives from being used to start any other hole. This provision addresses the hazard of accidentially drilling into undetonated explosives or detonators remaining in a previously loaded borehole. Miners have been fatally injured while drilling into holes that contained misfired explosives.

Paragraph (e) requires that when blasting slab rounds off the solid, the opener holes not be drilled beyond the rib line. Boreholes drilled beyond the rib line can result in overburdened shots which contribute to the ocurrence of blown-out shots and an increased risk of methane and dust ignitions.

Paragraph (f) provides that when coal is cut for blasting, the coal must be supported if necessary to maintain the stability of each borehole to be loaded with explosives. This provision appeared in the preproposal draft, but was not in the proposal. A commenter objected to this deletion because boreholes may collapse after being loaded. Boreholes which collapse or are otherwise affected by sagging or collapsing of cut coal can result in unconfined or blown-out shots. For example, if explosives are loaded into boreholes in a working place which has been undercut to a depth of 10 feet and the first 3-foot distance of the cut then sags or collapses, the explosives may be separated from the stemming material allowing the shots to be fired unconfined. A common practice for supporting the coal in such situations is placing a few blocks of wood in the undercut area of the face. Therefore, MSHA has revised the final rule to include this requirement.

Section 75.1316 Preparation before blasting.

This final rule is derived from existing § 75.1307 and Part 15, except paragraph (d) which is new. This section sets forth the requirements for deenergizing or removing electric equipment and determining the depth and direction of boreholes. It also identifies situations when explosives are not permitted to be loaded in boreholes. It address the hazards of premature detonation of the explosives being placed in boreholes.

Paragraph (a) requires that before priming explosives, all mobile electric equipment be removed to a distance of 50 feet from the working place or any other area where blasting is to be performed. This paragraph also requires that stationary electric equipment within 50 feet of these areas be deenergized. Failure to deenergize these sources increases the risk of accidental initiation of detonators and explosives by stray electric current.

The 50-foot distance for mobile and stationary electric equipment was added to the final rule in response to a commenter who stated that some clarification was necessary to provide guidance to the mining industry as to what equipment should be removed or deenergized. This commenter was concerned that the proposal would be open to a variety of interpretations including the complete deenergization of all electric equipment on a producing section and that such a procedure is not necessary to maintain safe blasting practices. The 50-foot distance, which is an accepted minimum distance used in the coal and metal and nonmetal mining industries, minimizes the potential of premature detonation.

Paragraph (b) specifies that before loading boreholes with explosives, each borehole must be cleared and its depth and direction determined. This provision addresses two primary concerns. First, coal dust created during drilling of the boreholes must be removed from the hole. Otherwise the coal dust can get between the explosive cartridges and prevent the entire explosive train from detonating. The second concern is that the qualified person know the amount of explosives in each borehole based on its depth and that adequate space is provided between each borehole. Determining the depth and direction of each borehole provides sufficient information for making these determinations. Boreholes with excessive amounts of explosive or inadequate spacing of boreholes has resulted in numerous blown-out shots and misfires.

One commenter suggested that a wooden tamping pole or other nonconductive tool be used to clear boreholes and to determine their depth and direction. This commenter stated that only nonsparking tools should be used in preparing boreholes or at any other stage of the blasting process. While a wooden tamping pole is normally used in determining these factors, the use of metallic tools does not present a hazard when clearing boreholes prior to loading explosives and should not be prohibited. At this initial state of the blasting process, there is no danger involved with the borehole because if has not yet been loaded with explosives. However, § 75.1318(g) of the final rule requires that only a nonconductive, nonsparking pole be used when loading explosives into the boreholes and when tamping the stemming material.

Paragraph (c) prohibits loading of explosives into boreholes that are drilled beyond the depth of cut coal unless the portion of the borehole deeper than the cut is filled with noncombustible material. Cut coal provides a second free face for the explosives to break the coal down. Firing explosives in boreholes drilled beyond the depth of cut coal increases the risk of blown-out shots and methane or dust ignitions.

One commenter suggested that only clay dummies or water stemming bags be used to fill the portion of a borehole that has been drilled beyond the limits of a cut. This commenter stated that clay or water would be compatible with the boreholes, while other noncombustible materials possibly would not. The purpose of filling the space beyond cut coal is to prevent explosives from being loaded into that portion of the borehole. Therefore, noncombustible materials other than clay or water could also serve this purpose.

Paragraph (d) requires that when two working faces are approaching each other, cutting, drilling or blasting be done at only one working face at a time if the two faces are within 25 feet of each other. Therefore, if a developing crosscut is being mined from both sides, mining operations must be conducted on only one side at a time when the distance between the two working faces is 25 feet or less. This requirement protects against accidental initiation of explosives by preventing cutting or drilling in an approaching working face from coming into contact with boreholes containing explosives on the opposite side. It also guards against blasting breaking through to another area where people are working.

One commenter recommended that this provision apply only during preparation for blasting to avoid possible misinterpretation of the provision. The intent of the provision is to limit any activity related to cutting, drilling, or blasting to only one side when two approaching faces are within 25 feet of each other. This requirement minimizes the potential of premature detonation and also minimizes the number of persons subject to such hazard.

A provision which appeared as paragraph (c) in this section of the proposed rule that addressed the type of work that could be performed when loading boreholes has been moved to § 75.1318 in the final rule.

Section 75.1317 Primer cartridges.

This new standard sets forth requirements for primer cartridges. A primer cartridge is an explosive cartridge with a detonator inserted in one end. Improper makeup of the primer cartridge can adversely affect the reliable detonation of explosives and contribute to the occurrence of misfires, creating safety hazards.

Paragraph (a) requires that primer cartridges be primed and loaded only by a qualified person or a person working in the presence of and under the direction of a qualified person. This requires the qualified person to be in the immediate presence of the person priming explosive cartridges at all times that this work is being performed. Since the hazards associated with explosives and detonators are greatly increased when the two are joined together, a person who is competent and knowledgeable must be present to ensure that proper procedures and precautions are followed.

Paragraph (b) prohibits the priming of cartridges until immediately before they are loaded in boreholes. An explosive cartridge primed with a detonator is very sensitive and subject to accidental detonation. Therefore, the time in which an explosive is allowed to remain primed prior to firing must be minimized.

The proposed rule did not contain certain requirements that were in the preproposal for priming explosive cartridges since they would be prepared by a qualified person proficient in the proper techniques for the performance of these tasks. However, MSHA accident data shows that failure of the blaster to follow safe blasting practices or regulations was a contributing factor in over 80 percent of the fatal blasting accidents from 1978 through 1984. Upon further consideration of this information, MSHA has determined that blasters require more specific guidance in the safe handling and use of explosives. Moreover, commenters did not object to the inclusion of specific instruction on priming in the preproposal. Therefore, paragraphs (c) and (d) have been added to the final rule.

Paragraph (c) specifies that only a nonsparking punch be used when priming explosive cartridges. This specification, appearing in the preproposal draft as nonferrous, was not

in the proposal. The use of a sparking-type punch could create a spark sufficient to cause premature detonation of an explosive. Therefore, only nonsparking punches are permitted.

Paragraph (d) requires detonators to be completely within and parallel to the length of the explosive cartridge and to be secured by half-hitching the leg wires around the cartridge or by an equally effective method. This provision, which was in the preproposal draft, was not in the proposal. Because placement and alignment of detonators in the explosive cartridge is necessary for safe and effective blasting, the Agency addresses these factors in the final rule. Detonators not properly inserted into the explosive cartridge can cause misfires. If a detonator protrudes through the explosive cartridge wrapping and is initiated, the full energy from the fired detonator will not be transmitted to the explosive cartridge and a misfire can occur. Securing the detonator by half-hitching the leg wires around the cartridge keeps the detonator in position while the cartridge is being loaded into the borehole. The use of the half-hitch knot or loop around the cartridge is standard industry practice for securing the detonator. However, the final rule permits other equally effective means of securing the detonators.

Section 75.1318 Loading boreholes.

This section is derived from existing provisions in Part 15, except for paragraphs (a), (c), (d), and (e) which are new. These standards address the procedures for loading boreholes which directly affect the performance of the explosive. Improper loading can contribute to misfires and blown-out shots.

Paragraph (a) provides that explosives must be loaded in boreholes only by qualified persons or persons working in the presence of and under the direction of a qualified person. This requirement addresses the risk of explosives being mishandled at this important phase of the blasting process by untrained persons.

Paragraph (b) requires that when boreholes are being loaded no other work except that necessary to protect persons be done in the working place or other area where blasting is to be performed. This practice reduces the risk of accidental detonations and the number of persons exposed to this hazard in the blasting area. This standard appeared in § 75.1316 in the proposal.

Paragraph (c) addresses procedures for loading boreholes drilled upward in solid rock or long holes drilled upward in anthracite mines. A commenter suggested that pushing all the cartridges to the back of the borehole in a continuous column be restricted to holes that are inclined at an angle of less than 45 degrees from the horizontal. This commenter stated that when loading vertical holes overhead in rock, it would be impossible to load all cartridges in a continuous column. MSHA recognizes that alternative means are necessary to maintain contact between cartridges of explosives in certain circumstances such as vertical boreholes in rock and when drilling long holes upward in anthracite mining. In these cases, some slitting and tamping may be necessary to ensure contact between cartridges and to prevent gaps or separations in the column which could result in misfires. Such slitting and taping will not be considered as damaging the explosives as prohibited by paragraph (e) below. Therefore, the final rule includes alternative means to provide a continuous column of explosives under these circumstances.

Paragraph (d) requires that when loading boreholes the primer cartridge be the first cartridge loaded in the borehole, that the end of the cartridge containing the detonator face the back of the borehole and that the primer cartridge and other explosives be pushed to the back of the borehole in a continuous column with no cartridge deliberately crushed or deformed. Inserting the primer cartridge into the borehole first with the detonator toward the back of the borehole places initiation of the explosives at the point of greatest burden which decreases the potential for blown-out shots. Pushing the explosives to the back of a borehole in a continuous column minimizes gaps and voids between cartridges and damage to them which can interrupt detonation of the column of explosives and result in misfires.

In response to the proposed rule, one commenter suggested that the continuous column be accomplished with no explosive cartridge being crushed. The Agency agrees that explosive cartridges should not be crushed when loading boreholes for blasting coal in bituminous coal mines. Bureau of Mines research conducted in 1949 (Technical Paper 716) shows that crushing explosive cartridges to fill a borehole increases the risk for ignition of methane during blasting as compared to loading cartridges in a continuous train without crushing. In a bituminous coal mine the coal dust is explosive and methane face ignitions have a potential for initiating an ensuing mine-wide coal dust explosion. On the other hand, the risk of a methane or coal dust ignition is greatly reduced when blasting rock. Moreover, anthracite coal dust is not explosive and will not propagate an explosion.

Paragraph (e) prohibits an explosive from being loaded into a borehole if it is damaged, deteriorated or incompletely filled. Using explosives that are not in their approved condition increases the risk of misfires and inadequate performance of explosives.

One commenter suggested that the words "incompletely filled" be deleted. This commenter stated that it is impossible to know if a cartridge is incompletely filled without cutting open the cartridge and examining the contents and thereby damaging, deforming or changing the specifications of the cartridge before firing it. The commenter further stated that it is the explosive manufacturer who has the responsibility for ensuring that a cartridge is completely filled, not the qualified person. MSHA agrees that the manufacturer is primarily responsible for ensuring that the explosives are manufactured as approved, which includes completely filling each explosive cartridge. However, should some incompletely filled products be inadvertently distributed by the manufacturer, those cartridges must not be used.

Incompletely filled cartridges are easily identifiable by visual inspection and by feeling the cartridge in the hands while loading. When an incompletely filled cartridge is squeezed, there is too much play in the material. Also, water gels and some emulsion explosives are in flexible plastic cartridges, and the qualified person can see the amount of material in these types of explosives, as well as feel it. Therefore, this suggestion has not been adopted in the final rule.

Paragraph (f), derived from Part 15, prohibits explosives of different brands, types or cartridge diameters from being loaded in the same borehole. Because of the sensitivity variations of different types of explosives, the use of different types or sizes of explosives in the same borehole can contribute to the occurrence of misfires.

Several commenters recommended that this paragraph be deleted. These commenters stated that all explosives must pass approval tests so that a mixing of products should not cause problems which would not otherwise occur. During the approval process for explosives, tests are conducted to ensure that cartridges of the same diameter and from the same manufacturer will propagate a detonation properly. Propagation is concerned with the rate at which detonation proceeds down a cartridge.

Different cartridge brands and size have different individual characteristics. When cartridges of the same brand are used together, a predictable result can be obtained which ensures continuous and uninterrupted propagation. No test research has been done to determine whether a mix of cartridge types and diameters can also propagate a detonation properly. Therefore, to ensure a continuous rate of detonation, explosive products must not be mixed.

Paragraph (g) requires that only nonconductive, nonsparking tamping poles be used for loading and tamping boreholes. This requirement, which is derived from existing Part 15, was not in the proposed rule. Commentors recommended that the existing term "nonmetallic" be changed to "nonferrous". The final rule uses the terms "nonconductive" and "nonsparking". The use of these types of tamping poles eliminates the potential for creating sparks that could cause premature detonation. The use of nonsparking connecting devices for extendable tamping poles is permitted by this standard.

In the proposed rule, this section also addressed the use of explosives that are below the approved minimum product firing temperature. Under the final rule, the minimum product firing temperature of explosives is addressed in § 75.1310.

Section 75.1319 Weight of explosives permitted in boreholes in bituminous and lignite mines.

This standard is derived from existing Part 15 and addresses the amount of explosives permitted when blasting coal, coal with rock partings, or fallen rock in bituminous or lignite mines. The use of explosives in excess of the stated limitations can result in excessive flame, coal dust, and methane being released into the mine atmosphere, creating the hazard of a methane or coal dust ignition. Excessive amounts of explosives can also contribute to the occurrence of cut-off shots in adjacent holes.

Paragraph (a) retains the existing 3-pound limit on explosives used in boreholes to blast coal, including coal with rock partings and fallen rock. Several commenters recommended that these requirements not be applicable when blasting fallen materials composed of rock and its surrounding coal strata outby the last open crosscut. While the hazards associated with blasting fallen material outby the last open crosscut may not be as great as in the face area, they still exist. For example, if coal dust and float coal dust present in these blasting areas are placed into suspension by the concussion from the blast, these materials can be ignited by flames caused by the use of excessive explosives. The Agency anticipates that sheathed explosive units will be used in the future to blast the vast majority of fallen material.

As in the existing standard, the final rule does not apply when blasting solid rock in its natural deposit. Blasting solid rock in its natural deposit can require explosives in excess of 3 pounds per borehole to properly blast the rock. Blasting solid rock with an insufficient amount of explosives can result in rock overhangs and loose roof which increase the hazards associated with cleaning up and supporting the area that has been blasted. In addition, the potential for an ignition of coal dust or methane is significantly less than when blasting coal. The proper amount of explosives per borehole depends on the specific circumstances involved. A commenter recommended that the proposed phrase "solid rock in its natural deposit" be replaced with the phrase "rock without mineable coal". This commenter stated that the proposed phrase could be misinterpreted to include sulfur balls and middle man in the coal face. The final rule is consistent with the existing regulation. MSHA is unaware of this provision being misinterpreted in the past.

Paragraph (b) requires a reduction in the weight of explosives by ½ pound for each foot of borehole less than 6 feet.

Section 75.1320 Multiple-shot blasting.

This standard is new, except for paragraph (a) which is derived from § 75.1303, and addresses requirements for detonator use and placement in multiple-shot blasting. Improperly fired multiple-shot blasts can result in blown-out and cut-off shots, both of which have resulted in the ignition of coal dust or methane.

Paragraph (a) prohibits mine operators from firing rounds containing more than 20 boreholes unless permitted in writing by the District Manager under § 75.1321. This provision addresses the hazard of firing more than 20 boreholes in a round which can release additional methane, generate more float coal dust and fumes, and create an increased potential for an explosion. MSHA received no objections to a specific 20-shot limitation in the preproposal draft. On the proposed rule, which was less specific, one commenter stated that 60 shots should be the limit for a round while other commenters stated that a 20-shot limitation should be specified for blasting coal. Most coal production blasting is done with 8–12 shots, with the number of shots varying according to the height or width of the coal. The need for blasting more than 20 boreholes more frequently occurs in development or construction work in rock, which would be permitted under § 75.1321.

Paragraph (b) prohibits instantaneous detonators and delay detonators from being used in the same blasting circuit in any underground coal mine. This practice, which would not have been specifically prohibited by the proposal, was added to the final rule in response to the recommendation of numerous commenters. These commenters pointed out, and MSHA agrees, that because of the different firing characteristics and firing times of instantaneous and short-delay detonators, the likelihood of misfires and the potential for blown-out shots is significantly increased when they are used in the same circuit.

Paragraph (c) is applicable to bituminous and lignite mines and specifies that only detonators with delay periods of 1,000 milliseconds or less be used when blasting in these mines. This constitutes an editorial change to conform to the definition of short-delay detonators and permits the use of instantaneous detonators. These are the only types of detonators that have been used in recent years and have proven to be safe and effective. They control the total elapsed blasting time of a round while minimizing the possibility of a methane or coal dust explosion.

A commenter suggested that the use of instantaneous detonators be prohibited. This commenter stated that short-delay detonators should be required in all mines and if exceptions are needed, a variance could be granted by the District Manager. The vast majority of detonators that will be used underground will be short-delay. However, as previously discussed, instantaneous detonators are required to be used when firing sheathed explosive units. They may also have some application when blasting rock. Instantaneous detonators can be safely used in these situations and to require that the use of instantaneous detonators be approved by the District Manager will create an unnecessary paperwork burden on the mining industry.

Consistent with this approach, the proposed requirement that short-delay detonators be used for multiple-shot blasting in anthracite mines when required by the District Manager is not included in the final rule. Upon further review, the Agency has determined that short-delay detonators are not typically used in anthracite mines and the need for their use in the foreseeable future is limited. Because of the different

characteristics of the coal seams, mining methods, and blasting techniques used in anthracite mines, long-delay detonators and instantaneous detonators are more appropriate for multiple-shot blasting. MSHA has no data or information to indicate that this practice is unsafe. However, as discussed above, instantaneous and delay detonators cannot be used in the same blasting circuit.

Currently, the total elapsed blasting time for short-delay electric detonators used in underground coal mines is limited to 500 milliseconds. However, research conducted by the Bureau of Mines, in conjunction with MSHA, has provided evidence that this time period can be extended to 1,000 milliseconds without increasing the risk of a methane or coal dust explosion. Accordingly, the final rule defines "short-delay detonator" as a detonator with a designated delay period of 25 to 1,000 milliseconds.

Paragraph (d) requires that each borehole in a round be initiated in sequence from the opener hole or holes in anthracite mines. The provision was in the preproposal draft and not in the proposal. Upon reconsideration, the Agency has determined that this is an important factor for blasting in anthracite mines and thus, it is addressed in the final rule. Since an opener hole is the first hole fired, it creates a second free face to provide additional relief for the remaining boreholes. This requirement provides for an orderly, controlled blast and prevents blown-out shots, cut-off shots and structural damage to the rib, roof, or ventilation system on steeply pitching seams.

Paragraph (e) addresses arrangement of detonator delay periods when blasting in bituminous and lignite mines. For blasting cut coal, this provision requires the first shot fired in the round to be initiated in the row nearest the kerf or shear. A kerf is a horizontal cut that is created by removing the coal near the bottom of the coal face with a cutting machine. On the other hand, a shear is a vertical cut that is created by removing a portion of the coal near the middle of the coal face or along each side. Both kerfs and shears provide a second free face for relief of the coal when the explosives are fired.

Paragraph (e)(1)(ii) addresses the interval between the designated delay periods of successive shots when blasting cut coal. The provision requires the interval to be at least 50 milliseconds, but not more than 100 milliseconds. The proposed requirement did not establish a range for the interval although the preproposal did specify such a range for sequential firing.

The interval between the designated delay periods of successive shots is an outgrowth of previous experimental research work conducted by the Bureau of Mines on multiple shot short-delay blasting. The interval established in this section of the rule is also supported by research performed in Great Britain and Western Europe and is a published recommendation of the Institute of Makers of Explosives. The research work has been published in International Conferences of Directors of Safety in Mines Research and in formal Bureau of Mines publications which are in the public domain. Establishing an upper limit of 100 milliseconds during sequential firing reduces the potential for ignition of gas or dust liberated during the firing of each successive shot. It also minimizes the potential for ignition from cut-off shots. The absence of an upper limit increases the probability of an explosion caused by explosives not being properly confined in a borehole and thus firing in a flammable atmosphere. Based on this technical data, MSHA has added this requirement to the final rule.

Paragraph (e)(2) addresses the arrangement of detonators and the interval between the designated delay periods of successive shots when blasting coal off the solid. When blasting coal off the solid, the provision requires each shot in the round to be initiated in sequence from the opener hole or holes. The firing of shots in sequence establishes a free face for successive shots, thereby reducing the potential for a blown-out shot. The required interval between successive shots when blasting coal off the solid is also based on experimental work by the Bureau of Mines in short-delay blasting.

Several commenters recommended the prohibition of blasting coal off the solid. Two multiple fatal blasting accidents were cited as justification for the prohibition. These commenters stated that blasting off the solid is a known hazard which is not economically justified. However, the Agency does not prohibit blasting off the solid in the final rule. Requirements in the final rule are directed to conducting blasting off the solid in a safe manner. The requirements control the amount of explosive used, provide for proper stemming and tamping, address placement of boreholes, regulate the sequence of firing, specify intervals between shots, and place a limitation on total elapsed blasting time not to exceed 1,000 milliseconds. In addition, the final rule contains more stringent requirements for the qualified persons who handle and use explosives. The Agency's investigation of the Adkins Coal Company explosives accident on December 7, 1981, and the FHR Coal Company explosives accident on January 20, 1982, which together resulted in 15 fatalities, revealed that although the technique of blasting coal off the solid was employed at these two mines, multiple violations of MSHA standards relative to the safe use of permissible explosives were cited as the cause of these accidents.

Section 75.1321 Permits for firing more than 20 boreholes and the use of nonpermissible blasting units.

This provision clarifies existing § 75.1303–1 which allows District Manager approval for firing more than 20 boreholes in a round and the use of nonpermissible blasting units. MSHA's experience has shown that mine operators have utilized it to obtain permits to use nonpermissible blasting units to fire large numbers of boreholes during construction blasting in rock. The removal of this provision from the proposal was based primarily upon the belief that permissible blasting units would be available to meet the mining industry's needs. However, MSHA has determined that, at this time, permissible blasting units do not have sufficient capacity to perform all development and construction blasting required by the industry. Therefore, the provision in the existing rule that permits the District Manager to authorize the firing of more than 20 boreholes per round and to use nonpermissible blasting units has been retained with minor editorial revisions, in the final rule.

Section 75.1322 Stemming boreholes.

This proposal is derived from existing § 75.1303 and Part 15, except paragraphs (b), (c), (f), (g), and (h) which are new. It sets forth procedures and requirements for stemming boreholes. Stemming in boreholes acts to suppress the flames during blasting. Failure to properly stem boreholes can result in blown-out shots.

Paragraph (a) requires only noncombustible material to be used for stemming boreholes. A commenter recommended deletion of the word "noncombustible" stating that the terminology would have allowed rock dust and wet sand bags to be used as stemming. It was also recommended, that stemming materials be restricted to clay and water. The final rule, like the existing provision, requires noncombustible material for stemming. Restricting use to clay and water would

limit the type of stemming material and not permit use of materials that could be as equally effective.

Paragraph (b) specifies that stemming material, except water bags, must be tamped to fill the entire cross-sectional area of the borehole. This requirement was not contained in the proposed rule but was included in the preproposal draft. Upon further review by the Agency, specific language is included in the final rule to require the tamping of stemming materials to fill the entire cross-sectional area of the borehole. Stemming material must be tamped to prevent flames from escaping when a borehole is fired.

Paragraph (c) requires that the stemming materials in each borehole contact the explosive cartridge nearest the collar of the borehole. Space or gaps between the stemming material and the explosives can significantly reduce the effectiveness of stemming in confining the flames generated by the initiation of explosives.

Paragraphs (d) and (e) specify the minimum amounts of stemming material to be used based on the depth of the borehole. Experience has shown these minimum amounts to be adequate for confining the flame generated by the initiation of explosives. When clay dummies, moist sand, loose clay, or other noncombustible materials are used for stemming, the specified depth of stemming in the borehole must be the depth after tamping.

Paragraph (f) specifies that only pliable clay dummies be used for stemming when blasting off the solid in bituminous and lignite mines. The preproposal provision would have prohibited the use of water stemming bags when blasting coal off the solid. This requirement was not in the proposal. In lieu of only allowing blasting off the solid where permitted by the District Manager, as required in the preproposal, the final rule instead provides stringent requirements for controlling this practice. One of these is the requirement that only pliable clay dummies be used as stemming when blasting off the solid which has been included as recommended by commenters. The use of pliable clay dummies provides additional resistance against blown-out holes which may result in a methane or coal dust ignition.

Paragraph (g) requires that the diameter of a water stemming bag and the diameter of the drill bit used to drill the borehole be within ¼ of an inch. The primary purpose of a water stemming bag is to provide a wall of water within the borehole to confine flames generated by the initiation of the explosives. The Bureau of Mines and MSHA have determined through tests that a spacing of not more than ¼ of an inch between the water stemming bag and the walls of a borehole allows the water to form a complete wall within the borehole and prohibits the flames from escaping into the mine atmosphere. However, tests have not been conducted on spacings greater than ¼ of an inch and therefore the rule limits the spacing to a known safe value.

Paragraph (h) sets forth those performance characteristics for tear- and flame-resistance of water stemming bags which are commercially available for use in underground coal mines. The preproposal specified that water stemming bags be approved by MSHA, but this provision was not included in the proposal. In the absence of approval requirements, the Agency added the performance characteristics of flame resistance and tear resistance in the final rule so that safe water stemming bags will be provided for use when blasting cut coal. The flame resistant property reduces the fire hazard of a water stemming bag that is shot out of a borehole into a flammable atmosphere during blasting. The tear resistant property minimizes the potential for a water bag to rip or lose its water holding capability while used to stem a borehole. The inclusion of these performance characteristics in the final rule is in response to comments which stated that the proposed rule would have permitted the use of untested systems.

Section 75.1323 Blasting circuits.

The final rule is derived from existing Part 15, except for paragraphs (b), (f), (g), (h), (i) and (j), which are new. The final rule establishes the requirements for the use and protection of blasting circuits, including the blasting cable. To ensure reliable detonation of explosives and to reduce the risk of misfires and premature or unplanned detonation, devices used in the blasting circuit must be appropriate for their intended purpose and properly maintained.

Paragraph (a) requires blasting circuits to be protected from stray electric current. Blasting circuits can become energized by extraneous sources of electricity and protection is necessary to prevent premature initiation of the explosives.

One commenter stated that static electricity is a form of extraneous electricity and should be added to the rule. MSHA agrees that static electricity is a form of stray electricity. However, the Agency has not specifically added "static electricity" to the rule because it is considered to be only one form of stray electricity and is covered by the provisions of the final rule.

Paragraph (b) prohibits the use of detonators made by different manufacturers in the same blasting circuit. Due to sensitivity variations and firing characteristics among detonators, the combining of detonators made by different manufacturers can result in misfires. No objections were raised by commenters to this provision.

Paragraph (c) requires detonator leg wires to be kept shunted until connected to the blasting circuit. As suggested by commenters, the wording of this paragraph has been modified for clarity. When leg wires are not shunted, the detonator is subject to initiation by extraneous electricity. Detonator leg wires are shunted when received from the manufacturer and must remain so until connected into the blasting circuit.

Paragraph (d) requires blasting cables to be well-insulated copper wire of a diameter size not smaller than 18-gauge and long enough to permit the round to be fired from a safe location. In response to a comment seeking clarification concerning the size limitation of the wire gauge, the final rule specifies that the wire diameter be not smaller than 18-gauge. The final rule sets a minimum standard for blasting cable compatibility with the size of capacity of permissible blasting units. Blasting cable lengths must permit the firing of the blast from a safe location that is around at least one corner from the blasting area.

One commenter recommended that the blasting cable be at least 125 feet in length. The commenter objected to the proposed rule because it did not designate a minimum length of blasting cable and, as a result, thought shot firers would be encouraged to shoot from an unsafe location. In response to the commenter, the final rule specifies that the cable be of a sufficient length to reach around one corner from the blasting area. This provides a physical barrier between the blasting area and the shot firer.

Paragraph (e) requires blasting cables to be shunted until immediately before the blast is fired, except when testing for circuit continuity. The connection of the blasting cable to the blasting unit before the round is ready to be fired significantly increases the risk of accidental initiation.

Paragraph (f) requires that wire used between the blasting cable and the detonator circuitry be well-insulated, have a resistance no greater than 20-gauge copper wire, and be not more than 30 feet long. These requirements prohibit the use of wire that is damaged or has a

resistance that may be inconsistent with the capabilities of the blasting unit.

One commenter recommended that the proposed rule increase the resistance from that of 20-gauge copper wire to 18-gauge copper wire based on a calculation that the increased resistance would reduce the current flow adversely affecting the result of the blast. In the final rule, the Agency has specified the wire between the blasting cable and detonator circuitry be not more than 30 feet long and have a resistance no greater than 20-gauge copper wire. The difference in the resistance of 18- and 20-gauge copper wire is insignificant (less than ¼ ohm) for a wire length of 30 feet and therefore the current flow would not be reduced sufficiently to adversely affect the result of the blast.

Paragraph (g) requires that all connections in the blasting circuit be properly spliced and sufficiently separated from other connections to prevent accidental contact or arcing. Poor connections increase the resistance of the blasting circuit. Connections that are too close together or contact each other can result in arcing and or short circuiting and increase the potential for a misfire.

Paragraph (h) requires that uninsulated connections be kept out of water and away from the coal, roof, ribs and floor. The term "bare" has been changed to "uninsulated" for clarity. Failure to protect uninsulated connections can result in loss of electric current through grounding, increasing the potential for misfires. A commenter suggested that these connections also be required to be kept "clean and shiny". The Agency has not adopted the commenter's suggestion since the rule also requires that all blasting circuits be tested for continuity, which will indicate the presence of proper circuit connections and continuity.

Paragraph (i) requires blasting circuits to be wired in a single series when 20 or fewer boreholes are to be fired in a round. This ensures that the resistance of the blasting circuit is compatible with permissible blasting units. One commenter suggested the wording be changed to "all holes to be wired in a 20 or fewer shot series" as opposed to "when 20 or fewer shots are fired in a round". This comment is not adopted in the final rule in order to maintain consistency with the definition of "round".

Paragraph (j) requires that blasting circuits be checked for circuit continuity and resistance using a blasting galvanometer or other instrument specifically designed for testing blasting circuits. This provision differs from the proposal which did not require that blasting circuits be checked for continuity and resistance but only required that certain instruments be utilized if checks for continuity were made. Two of the known causes of misfires are the lack of continuity or excessive electrical resistance in the blasting circuit. MSHA's field experience and assessment of factors and causes of blasting accidents are indicative of the need to check continuity and resistance to prevent misfires during blasting. Review of published recommendations from the Bureau of Mines and British research, recommendations published by the Institute of Makers of Explosives and industry-wide comments regarding the absence of this requirement in the proposed rule support this provision. MSHA has, therefore, modified this rule to require that blasting circuits be tested with a proper instrument for continuity and resistance. This provision minimizes the potential for misfires and eliminates the possibility of accidental initiation of explosives through use of improper checking devices which can carry excessive current capacity. This provision is consistent with circuit testing requirements for metal and nonmetal mines in 30 CFR 56.6121 and 57.6121.

Section 75.1324 Methane concentration and tests.

This standard was in the proposed rule and is derived from existing §§ 75.320 and 75.1302. It addresses methane concentrations and tests in areas where explosives are to be fired. Blasting in areas which contain explosive concentrations of methane can cause mine explosions.

Paragraph (a) prohibits blasting in any area that contains 1.0 volume percent or more of methane. While a one percent concentration of methane in air is not explosive, it is recognized throughout the coal mining community as the level at which steps must be taken to remove the methane.

Paragraph (b) requires that tests for methane be made immediately before shots are fired and that these tests be made by a person qualified to conduct such tests. Methane tests made immediately before the shots are fired provide a warning of methane concentrations at or above 1.0 volume percent.

One commenter recommended the addition of a new provision that would require rock dust to be applied to all surfaces from the face for at least 40 feet in all directions. The commenter stated that the existing standards do not require rock dusting to the face but would permit rock dusting to stop 39 feet from the face. The commenter added that the area surrounding the blast is the critical area that needs the rock dust. The Agency's current regulations in § 75.402 specify that all underground areas of a coal mine be rock dusted to within 40 feet of all working faces. Also, § 75.401 specifies that in working places, particularly in distances less than 40 feet from the face, water, with or without a wetting agent, or other no less effective method must be applied to coal dust on the ribs, roof, and floor to reduce dispersibility and to minimize the explosion hazard. The Agency has not found these safety requirements to be inadequate and, therefore, has not adopted the commenter's recommendation to require application of rock dust to all surfaces from the face for at least 40 feet in all directions.

Section 75.1325 Firing procedure.

This standard sets forth the procedures to be followed when firing explosives. It is derived from existing Part 15 except for paragraph (b) which is new.

Paragraph (a) requires that shots be fired only by a qualified person or a person working in the presence of and under the direction of a qualified person.

Paragraph (b) limits blasting in a working place to one face at a time. One commenter recommended deleting the proposed exception which would have permitted blasting up to three faces in a single working place. The final rule does not allow blasting more than one face at a time. Simultaneous firing of more than one face at a time can release additional methane, generate more dust and fumes, and create a greater potential for an explosion hazard. Another commenter stated the proposal, should limit the numbers of boreholes fired in a round to no more than 20. The final rule in § 75.1320(a) provides that no more than 20 boreholes can be fired in a round unless a permit is granted by the District Manager.

Paragraph (c) requires certain steps to be taken before a blast is fired, including the evacuation of persons from areas where a hazard would be created by the blast, a determination by the qualified person that all persons are a safe distance from the blasting area, and an issuance of warnings that a blast is to be fired. These precautions minimize the exposure of miners to the hazards created by the force of the blast.

Several commenters suggested that the proposed requirement specifying the evacuation of persons when blasting be revised to require them to leave the working place and other areas where a hazard would be created. Commenters

also suggested clarifying that only those persons required to leave need to be around one corner from the blast. In response to these comments, the final rule has been reworded to address these concerns.

One commenter suggested that the verbal warning given before blasting be specific and consistent throughout the industry. The Agency has not adopted specific warning language. It is the responsibility of the qualified person to determine that all persons are a safe distance from the blasting area regardless of the warning given.

Paragraph (d) requires all shots to be fired promply after they are ready to be fired. This practice minimizes the time interval between the warning and firing of the round.

At the request of several commenters, § 75.1324(e) of the proposed rule has been moved and now appears as § 75.1326(c) of the final rule.

Section 75.1326 Examination after blasting.

This standard is derived from existing § 75.1308 and Part 15 and specifies the steps to be taken after blasting. It prohibits entry into the blast area before it is clear of smoke and dust. The concentrations of smoke and dust immediately after the blast can impair the recognition of hazards such as unstable roof and rib conditions. The rule also requires that a qualified person or a person working in the presence of and under the direction of a qualified person examine the area for misfires, methane and other hazardous conditions as soon as the smoke and dust have cleared. An immediate examination after blasting enables prompt action to be taken to correct any hazards resulting from the blast. In addition, the rule requires that if a round has partially detonated the qualified person must leave the area at once and no persons are to reenter the affected area for at least 5 minutes.

Many commenters recommended changing the proposed waiting period of at least 15 minutes found in the proposal at § 75.1324(e), to a waiting period of at least 5 mintues before entering an affected area when a round partially detonates. Commenters stated that the additional waiting period of 10 minutes or more could potentially permit serious problems to develop, particularly in mines where high methane liberation is common. Commenters also stated that partial detonation might result in damage to ventilation equipment in or near the face area and if repairs were not made immediately, dangerous accumulations of methane could occur. Commenters also cited several State laws which impose a 5-minute waiting period before persons are permitted to enter an affected area where a misfire has occurred. Other commenters favored the 15 minute waiting period. The Agency has adopted the waiting period of 5 minutes in the final rule. Should a fire occur from a partially detonated explosive, a longer waiting period may result in the inability to fight and extinguish the fire. The Agency also considered the increased hazard inherent in the accumulation of methane to explosive levels should damage occur to the ventilation system resulting from a protracted period of time before re-entry to the area containing a partially detonated round.

Section 75.1327 Misfires.

This final rule is derived from Part 15 except paragraph (b) which is new. It specifies general procedures to be followed in the handling of misfires. Misfires that are not found and disposed of promptly and safely can be accidentally detonated during loading or other operations, creating the potential for serious injury. Because of varying product performance characteristics, the rule does not specify a particular procedure for handling misfires, but allows a qualified person and mine management to address these situations on a case-by-case basis.

Paragraph (a) limits the work in the area affected by a misfire to that done by a qualified person to dispose of the misfire and other work to protect persons, such as making necessary roof control adjustments. This measure limits the exposure of persons to the hazard of accidental detonation.

A commenter suggested that the area in which a qualified person is working to dispose of misfires should be "dangered off" until the misfire is disposed of. The rule addresses the substance of this commenter's concern by restricting work permitted in the affected area to only that of a qualified person and other work necessary to protect persons.

Paragraph (b) of the final rule, as did the proposal, addresses to steps to be followed when a misfire cannot be disposed of by a qualified person. The rule requires each accessible entrance to the affected area to be posted with a warning to prohibit entry. The rule also requires immediate reporting of undisposed misfires to mine management so that technical assistance can be arranged to safely dispose of the misfire.

One commenter suggested that the information concerning misfires reported to mine management be recorded and maintained as a record signed by the mine foreman. The purpose of the rule is to provide information for mine management that will assist in disposing of misfires and in identifying and eliminating the cause of misfires. Requiring the mine operator to keep a record of each misfire adds to the burden of paperwork and provides no reasonable assurance that keeping such records will provide the means to reduce the incidents of misfires that may occur. The Agency considers that the manner in which this information is kept is an appropriate matter for mine management that need not be regulated.

Section 75.1328 Damaged or deteriorated expolosives and detonators.

This standard sets forth new requirements for handling and disposing of damaged or deteriorated explosives or detonators. Such exposives and detonators are required by paragraph (a) to be placed in separate containers of nonconductive and nonsparking material and removed from the mine or placed in a magazine for later removal. Several commenters recommended that damaged or deteriorated explosives and detonators be placed in separate containers constructed of nonsparking materials rather than being placed in separate containers with absorbent material as specified in the proposal. Commenters stated that absorbent material could cause an increased hazard if the wrong type of absorbent material, such as coal dust, is used. The use of a container constructed of nonsparking material effectively minimizes the possibility of inadvertent detonation.

The same commenters recommended removal of damaged explosives and detonators at the end of the shift to prevent exposing miners to unnecesary hazards. This suggestion was not adopted because paragraph (c) of this standard requires deteriorated explosives and detonators to be handled and disposed in accordance with the instructions of the manufacturer.

Paragraph (b) requires damaged detonators to be shunted, if practicable, before either being removed from the mine or placed in a magazine. One commenter recommended that damaged or deteriorated detonators be protected from stray current. The final rule addresses this provision by means of shunting the detonators, when practicable.

Paragraph (c) requires damaged or deteriorated explosives or detonators to be handled and disposed of in accordance with the instructions of the manufacturer and is from the preproposal draft. Commenters

requested inclusion of this provision in the final rule, although it was not in the proposed rule. Because of the variety of explosive formulations and detonator types and characteristics, the instructions provided by manufacturers are relied upon by the mining industry as the authoritative source of information when disposing of damaged or deteriorated explosives. Other commenters recommended that damaged expolsives and detonators be disposed of only on the surface. However, the place and method of disposal is addressed in the manufacturer's specific instructions.

Derivation Table

The following derivation table lists the section number of each standard in the final rule and the section number of the existing standard from which it is derived.

New Section	Old Section
75.1300	75.2 and Part 15.2.
75.1301	Part 15 (Article IV).
75.1310	75.1300, 75.1303 and Part 15.19(d).
75.1310(d)	New.
75.1311	75.1301, 75.1304, 75.1305 and 75.1403-7(i).
75.1311(b)(2)	New.
75.1312	75.1301, 75.1306, 75.1307 and Part 15.19(b).
75.1312 (c), (f) and (g)	New.
75.1313 (a) and (c)	New.
75.1313(b)	75.1301, 75.1304, 75.1306 and 75.1307.
75.1314	New.
75.1315	75.1300, 75.1302 and Part 15 (Article IV).
75.1315(d), (e) and (f)	New.
75.1316	75.1307 and Part 15 (Article IV).
75.1316(d)	New.
75.1317	New.
75.1318 (a), (c), (d) and (e).	New.
75.1318 (b), (f), (g)	Part 15 (Article IV).
75.1319	Part 15 (Article IV).
75.1320(a)	75.1303.
75.1320 (b), (c), (d) and (e).	New.
75.1321	75.1303-1.
75.1322(a)	75.1303 and Part 15 (Article IV).
75.1322 (c), (d) and (e)	Part 15 (Article IV).
75.1322 (b), (f), (g) and (h).	New.
75.1323 (a), (b), (c), (d) and (e).	Part 15 (Article IV).
75.1323 (f), (g), (h), (i) and (j).	New.
75.1324	75.320 and 75.1302.
75.1325	Part 15 (Article IV).
75.1325(b)	New.
75.1326	75.1308 and Part 15 (Article IV).
75.1327 (a) and (b)(2)	Part 15 (Article IV).
75.1327(b)(1)	New.
75.1328	New.

Distribution Table

The following distribution table lists the section number of each existing standards in Subpart N and Part 15 and the section number of the final rule that contain revised provisions derived from the corresponding existing section.

Old Section	New Section
75.1300	75.1310 and 75.1315.
75.1301	75.1311, 75.1312 and 75.1313.
75.1302 (a) and (b)	75.1315.
75.1302(c)	75.1324.
75.1303	75.1310, 75.1320(a) and 75.1322.
75.1303-1	75.1321.
75.1304	75.1311 and 75.1313.
75.1305	75.1311.
75.1306	75.1312 and 75.1313.
75.1307	75.1312, 75.1313 and 75.1316(a).
75.1308	75.1326.
Part 15	75.1301, 75.1310, 75.1312, 75.1315 75.1316, 75.1318, 75.1319, 75.1322, 75.1323, 75.1325, 75.1326 and 75.1327.

III. Drafting Information

The principal persons responsible for preparing this final rule are: Edward C. Connor and A. Keith Watson, Coal Mine Safety and Health, MSHA; Harry C. Verakis, Technical Support, MSHA; Richard J. Mainiero, Bureau of Mines; Helen B. Caraway, Office of Standards, Regulations and Variance, MSHA; and Linda Fort, Office of the Solicitor, Department of Labor.

IV. Executive Order 12291 and Regulatory Flexibility Act

In accordance with Executive Order 12291, MSHA has prepared an analysis to identify potential costs and benefits associated with the final changes to its explosives and blasting standards for underground coal mines. The Agency has incorporated this analysis into the Regulatory Flexibility Analysis required by the Regulatory Flexibility Act. In this analysis, summarized below, MSHA has determined that the final rule would not result in major cost increases nor have an effect of $100 million or more on the economy. Therefore, the rule is not within the criteria for a major rule and a Regulatory Impact Analysis is not required.

The Regulatory Flexibility Act requires that agencies evaluate and include, wherever possible, compliance alternatives that minimize any adverse impact on small business when developing regulatory proposals. The final rule clarifies compliance responsibilities and adopts performance-oriented standards which will benefit small mining operations.

In the following summary of the Initial Regulatory Flexibility Analysis, MSHA has compared the costs and benefits associated with the final requirements with the costs of the existing requirements. A copy of the full analysis is available upon request.

MSHA estimates the annual cost for compliance with the existing requirements to be $2.5 million compared to $2.9 million for the final rule. The final regulations effect approximately 1700 underground mining operations. MSHA estimates about 975 of these mines are small businesses. The impact on small mines under existing requirements is $1.5 million compared to $1.8 million for the final rule representing a 19 percent increase. For purposes of the Regulatory Flexibility Act, MSHA has defined small business entities as mines with fewer than 20 employees.

In developing cost estimates, MSHA has taken into consideration industry-wide practices. Compliance costs are related to labor, supplies, and equipment purchase and maintenance. In calculating the costs of the existing standards and the final rule, the Agency projected capital expenditures and recurring costs.

In the final rule, MSHA has reorganized, updated, and clarified existing provisions and deleted duplicative provisions. MSHA believes that clarification will foster a better understanding of safe blasting practices and that the new final requirements, especially those that address the use of sheathed explosive units, will afford greater protection for the miners.

The primary benefit of the final rule is the enhanced protection that the standards will provide to miners who are exposed to the hazards related to the use of explosives.

V. Paperwork Reduction Act of 1980

The final rule contains two collection of information provisions subject to the Paperwork Reduction Act of 1980 (Pub. L. 96-511). The information collection requirements in existing Part 15 and § 75.1303-1, concerning certification of shot firer qualification and permits for the use of nonpermissible blasting units and to fire more than 20 boreholes, are retained in final §§ 75.1301 and 75.1321.

In accordance with section 3504(h) of the Paperwork Reduction Act of 1980 (Title 44 U.S.C. Chapter 35), the collection of information requirements contained in §§ 75.1301 and 75.1321 of the final rule have been approved by

OMB under control numbers 1219–0106 and 1219–0025.

List of Subjects in 30 CFR Part 75

Mine safety and health, Mandatory safety standards, Underground coal mines, Explosives and blasting.

Date: November 9, 1988.

David C. O'Neal,

Deputy Assistant Secretary for Mine Safety and Health.

Accordingly, pursuant to 30 U.S.C. 811 Part 75 Subchapter N, Chapter I, Title 30 of the Code of Federal Regulations is amended as set forth below:

PART 75—MANDATORY SAFETY STANDARDS—UNDERGROUND COAL MINES

1. The authority citation for Part 75 continues to read as follows:

Authority: 30 U.S.C. 811, 957, 961.

2. Paragraph (c)(2) of § 75.2 is removed and paragraph (c)(3) is redesignated as (c)(2).

3. Newly redesignated § 75.2(c)(2) is revised to read as follows:

§ 75.2 Definitions

* * * * *

(c)* * *

(2) The manner of use of equipment means the manner of use prescribed by the Secretary.

* * * * *

Subpart D—Ventilation

§ 75.320 [Removed]

4. Subpart D is amended by removing § 75.320.

Subpart O—Hoisting and Mantrips

§ 75.1403–7 [Amended]

5. Section 75.1403–7 is amended by removing and reserving paragraph (i).

6. Subpart N is revised to read as follows:

Subpart N—Explosives and Blasting

Sec.

75.1300 Definitions.
75.1301 Qualified person.
75.1310 Explosives and blasting equipment.
75.1311 Transporting explosives and detonators.
75.1312 Explosives and detonators in underground magazines.
75.1313 Explosives and detonators outside of magazines.
75.1314 Sheathed explosive units.
75.1315 Boreholes for explosives.
75.1316 Preparation before blasting.
75.1317 Primer cartridges.
75.1318 Loading boreholes.
75.1319 Weight of explosives permitted in boreholes in bituminous and lignite mines.
75.1320 Multiple-shot blasting.
75.1321 Permit for firing more than 20 boreholes and to use nonpermissible blasting units.
75.1322 Stemming boreholes.
75.1323 Blasting circuits.
75.1324 Methane concentration and tests.
75.1325 Firing procedure.
75.1326 Examination after blasting.
75.1327 Misfires.
75.1328 Damaged or deteriorated explosives and detonators.

Subpart N—Explosives and Blasting

§ 75.1300 Definitions.

The following definitions apply in this subpart.

Approval. A document issued by MSHA which states that an explosive or explosive unit has met the requirements of this part and which authorizes an approval marking identifying the explosive or explosive unit as approved as permissible.

Battery starting. The use of unconfined explosives to start the flow of coal down a breast or chute in an anthracite mine.

Blasting off the solid. Blasting the working face without providing a second free face by cutting, shearing or other method before blasting.

Instantaneous detonator. An electric detonator that fires within 6 milliseconds after application of the firing current.

Laminated partition. A partition composed of the following material and minimum nominal dimensions: ½-inch thick plywood, ½-inch thick gypsum wall board, ⅛-inch thick low carbon steel and ¼-inch thick plywood, bonded together in that order.

Opener hole. The first hole or holes fired in a round blasted off the solid to create an additional free face.

Permissible blasting unit. A device that has been approved by MSHA and that is used for firing electric detonators.

Permissible explosive. Any substance, compound or mixture which is approved by MSHA and whose primary purpose is to function by explosion.

Round. A group of boreholes fired or intended to be fired in a continuous sequence with one application of the firing current.

Sheathed explosive unit. A device consisting of an approved or permissible explosive covered by a sheath encased in a sealed covering and designed to be fired outside the confines of a borehole.

Short-delay electric detonator. An electric detonator with a designated delay period of 25 to 1,000 milliseconds.

§ 75.1301 Qualified person.

(a) A qualified person under this subpart is a person who—

(1) Is certified or qualified to use explosives by the State in which the mine is located provided that the State requires a demonstration of ability to safely use permissible explosives as prescribed by this subpart effective January 17, 1989; or

(2) In States that do not certify or qualify persons to use explosives required by this section, has at least 1 year of experience working underground on a coal producing section of a mine where explosives are used and demonstrates to an authorized representative of the Secretary the ability to safely use permissible explosives.

(b) Persons qualified or certified by a State to use permissible explosives in underground coal mines as of May 17, 1989 are considered qualified under this section even though their State program did not contain a demonstration of ability requirement.

§ 75.1310 Explosives and blasting equipment.

(a) Only permissible explosives, approved sheathed explosive units, and permissible blasting units shall be taken or used underground.

(b) Black blasting powder, aluminum-cased detonators, aluminum-alloy-cased detonators, detonators with aluminum leg wires, and safety fuses shall not be taken or used underground.

(c) Explosives shall be fired only with a permissible blasting unit used in a manner consistent with its approval. Blasting units approved by MSHA that have approval labels specifying use with short-delay detonators with delay periods between 25–500 milliseconds are accepted to fire short-delay detonators up to 1,000 milliseconds, instantaneous detonators and long period delay detonators for anthracite mines.

(d) Permissible explosives and sheathed explosive units shall not be used underground when they are below the minimum product firing temperature specified by the approval. Explosives previously approved which do not specify a minimum firing temperature are permissible for use so long as the present approval is maintained.

(e) Electric detonators shall be compatible with the blasting unit and have sufficient strength to initiate the explosives being used.

§ 75.1311 Transporting explosives and detonators.

(a) When explosives and detonators are to be transported underground—

(1) They shall be enclosed in separate, substantially constructed containers made of nonconductive material, with

no metal or other conductive materials exposed inside, except as specified in paragraph (d) of this section; and

(2) Each container of explosives and of detonators shall be indelibly marked with a readily visible warning identifying the contents.

(b) When explosives and detonators are transported by any cars or vehicles—

(1) The cars or vehicles shall be marked with warnings to identify the contents as explosive. The warnings shall be readily visible to miners approaching from any direction and in indelible letters;

(2) Explosives and detonators shall be transported either in separate cars or vehicles, or if in the same cars or vehicles as follows:

(i) Class A and Class C detonators in quantities greater than 1,000 shall be kept in the original containers as shipped from the manufacturer and separated from explosives by a hardwood partition at least 4 inches thick, a laminated partition or equivalent; and

(ii) Class A and Class C detonators in quantities of no more than 1,000 shall be separated from explosives by a hardwood partition at least 4 inches thick, a laminated partition or equivalent.

(3) No persons, other than those necessary to operate the equipment or to accompany the explosives and detonators, shall be transported with explosives and detonators, and

(4) When explosives and detonators are transported using trolley locomotives—

(i) Trips carrying explosives and detonators shall be separated from all other mantrips by at least a 5-minute interval; and

(ii) Cars containing explosives or detonators shall be separated from the locomotives by at least one car that is empty or that contains noncombustible materials.

(c) When explosives and detonators are transported on conveyor belts—

(1) Containers of explosives shall be separated from containers of detonators by at least 50 feet;

(2) At least 6 inches of clearance shall be maintained between the top of any container of explosives or container of detonators and the mine roof or other obstruction;

(3) Except when persons are riding the belt to accompany explosives or detonators, a person shall be at each transfer point between belts and at the unloading location; and

(4) Conveyor belts shall be stopped before explosives or detonators are loaded or unloaded.

(d) When explosives and detonators are transported by hand they shall be carried in separate, nonconductive, closed containers.

§ 75.1312 Explosives and detonators in underground magazines.

(a) The quantity of explosives kept underground shall not be more than is needed for 48 hours of use.

(b) Except as provided in § 75.1313, explosives and detonators taken underground shall be kept in—

(1) Separate, closed magazines at least 5 feet apart; or

(2) The same closed magazine when—

(i) Separated by a hardwood partition at least 4 inches thick; or

(ii) Separated by a laminated partition; or

(iii) Separated by a device that is equivalent.

(c) Only explosives and detonators shall be kept in underground magazines.

(d) Magazines shall be substantially constructed and all interior surfaces shall be made of nonconductive material, with no metal or other conductive material exposed inside.

(e) All magazines shall be—

(1) Located at least 25 feet from roadways and any source of electric current;

(2) Located out of the direct line of the forces from blasting; and

(3) Kept as dry as practicable.

(f) Magazine locations shall be posted with indelibly marked and readily visible warnings indicating the presence of explosives.

(g) Only materials and equipment to be used in blasting shall be stored at magazine locations.

§ 75.1313 Explosives and detonators outside of magazines.

(a) The quantity of explosives outside a magazine for use in a working section or other area where blasting is to be performed shall—

(1) Not exceed 100 pounds; or

(2) Not exceed the amount necessary to blast one round when more than 100 pounds of explosives is required.

(b) Explosives and detonators outside a magazine that are not being transported or prepared for loading boreholes shall be kept in closed separate containers made of nonconductive material with no metal or other conductive material exposed inside and the containers shall be—

(1) At least 15 feet from any source of electric current;

(2) Out of the direct line of the forces from blasting;

(3) In a location to prevent damage by mobile equipment; and

(4) Kept as dry as practicable.

(c) Explosives and detonators not used during the shift shall be returned to a magazine by the end of the shift.

§ 75.1314 Sheathed explosive units.

(a) A separate instantaneous detonator shall be used to fire each sheathed explosive unit.

(b) Sheathed explosive units shall be primed and placed in position for firing only by a qualified person or a person working in the presence of and under the direction of a qualified person. To prime a sheathed explosive unit, the entire detonator shall be inserted into the detonator well of the unit and be held securely in place.

(c) Sheathed explosive units shall not be primed until immediately before the units are placed where they are to be fired. A sheathed explosive unit shall not be primed if it is damaged or deteriorated.

(d) Except in anthracite mines, rock dust shall be applied to the roof, ribs and floor within a 40-foot radius of the location where the sheathed explosive units are to be fired.

(e) No more than three sheathed explosive units shall be fired at one time.

(f) No sheathed explosive unit shall be fired in contact with another sheathed explosive unit.

§ 75.1315 Boreholes for explosives.

(a) All explosives fired underground shall be confined in boreholes except—

(1) Sheathed explosives units and other explosive units approved by MSHA for firing outside the confines of a borehole; and

(2) Shots fired in anthracite mines for battery starting or for blasting coal overhangs. No person shall go inside a battery to start the flow of material.

(b) Each borehole in coal for explosives shall be at least 24 inches from any other borehole and from any free face, unless prohibited by the thickness of the coal seam.

(c) Each borehole in rock for explosives shall be at least 18 inches from any other borehole in rock, at least 24 inches from any other borehole in coal, and at least 18 inches from any free face.

(d) No borehole that has contained explosives shall be used for starting any other hole.

(e) When blasting slab rounds off the solid, opener holes shall not be drilled beyond the rib line.

(f) When coal is cut for blasting, the coal shall be supported if necessary to maintain the stability of the column of explosives in each borehole.

§ 75.1316 Preparation before blasting.

(a) Before priming any explosives—

(1) All mobile electric equipment shall be removed to a distance of at least 50 feet from the working place or other area where blasting is to be performed; and

(2) All stationary electric equipment within 50 feet of the working place or other area where blasting is to be performed shall be deenergized.

(b) Before loading boreholes with explosives, each borehole shall be cleared and its depth and direction determined.

(c) No borehole drilled beyond the depth of cut coal shall be loaded with explosives unless that portion of the borehole deeper than the cut is tamped with noncombustible material.

(d) When two working faces are approaching each other, cutting, drilling and blasting shall be done at only one working face at a time if the two faces are within 25 feet of each other.

§ 75.1317 Primer cartridges.

(a) Primer cartridges shall be primed and loaded only by a qualified person or a person working in the presence of and under the direction of a qualified person.

(b) Primer cartridges shall not be primed until immediately before loading boreholes.

(c) Only a nonsparking punch shall be used when priming explosive cartridges.

(d) Detonators shall be completely within and parallel to the length of the cartridge and shall be secured by half-hitching the leg wires around the cartridge or secured by an equally effective method.

§ 75.1318 Loading boreholes.

(a) Explosives shall be loaded by a qualified person or a person working in the presence of and under the direction of a qualified person.

(b) When boreholes are being loaded, no other work except that necessary to protect persons shall be done in the working place or other area where blasting is to be performed.

(c) When loading boreholes drilled at an angle of 45 degrees or greater from the horizontal in solid rock or loading long holes drilled upward in anthracite mines—

(1) The first cartridge in each borehole shall be the primer cartridge with the end of the cartridge containing the detonator facing the back of the borehole; and

(2) The explosive cartridges shall be loaded in a manner that provides contact between each cartridge in the borehole.

(d) When loading other boreholes—

(1) The primer cartridge shall be the first cartridge loaded in the borehole;

(2) The end of the cartridge in which the detonator is inserted shall face the back of the borehole; and

(3) The primer cartridge and other explosives shall be pushed to the back of the borehole in a continuous column with no cartridge being deliberately crushed or deformed.

(e) An explosive shall not be loaded into a borehole if it is damaged, deteriorated of if the cartridge is incompletely filled.

(f) Explosives of different brands, types or cartridge diameters shall not be loaded in the same borehole.

(g) Only nonconductive, nonsparking tamping poles shall be used for loading and tamping boreholes. The use of nonsparking connecting devices for extendable tamping poles is permitted.

§ 75.1319 Weight of explosives permitted in boreholes in bituminous and lignite mines.

(a) The total weight of explosives loaded in any borehole in bituminous and lignite mines shall not exceed 3 pounds except when blasting solid rock in its natural deposit.

(b) The total weight of explosives loaded in a borehole less than 6 feet deep in bituminous and lignite mines shall be reduced by ½ pound for each foot of borehole less than 6 feet.

§ 75.1320 Multiple-shot blasting.

(a) No more than 20 boreholes shall be fired in a round unless permitted in writing by the District Manager under § 75.1321.

(b) Instantaneous detonators shall not be used in the same circuit with delay detonators in any underground coal mine.

(c) In bituminous and lignite mines, only detonators with delay periods of 1,000 milliseconds or less shall be used.

(d) When blasting in anthracite mines, each borehole in a round shall be initiated in sequence from the opener hole or holes.

(e) Arrangement of detonator delay periods for bituminous and lignite mines shall be as follows:

(1) When blasting cut coal—

(i) The first shot or shots fired in a round shall be initiated in the row nearest the kerf or the row or rows nearest the shear; and

(ii) After the first shot or shots, the interval between the designated delay periods of successive shots shall be at least 50 milliseconds but not more than 100 milliseconds.

(2) When blasting coal off the solid—

(i) Each shot in the round shall be initiated in sequence from the opener hole or holes; and

(ii) After the first shot or shots, the interval between the designated delay periods of successive shots shall be at least 50 milliseconds but not more than 100 milliseconds.

§ 75.1321 Permits for firing more than 20 boreholes and for use of nonpermissible blasting units.

(a) Applications for permits for firing more than 20 boreholes in a round and for the use of nonpermissible blasting units shall be submitted in writing to the District Manager for the district in which the mine is located and shall contain the following information:

(1) The name and address of the mine;

(2) The active workings in the mine affected by the permit and the approximate number of boreholes to be fired;

(3) The period of time during which the permit will apply;

(4) The nature of the development or construction for which they will be used, e.g., overcasts, undercasts, track grading, roof brushing or boom holes;

(5) A plan, proposed by the operator designed to protect miners in the mine from the hazards of methane and other explosive gases during each multiple shot, e.g., changes in the mine ventilation system, provisions for auxiliary ventilation and any other safeguards necessary to minimize such hazards;

(6) A statement of the specific hazards anticipated by the operator in blasting for overcasts, undercasts, track grading, brushing of roof, boom holes or other unusual blasting situations such as coalbeds of abnormal thickness; and

(7) The method to be employed to avoid the dangers anticipated during development or construction which will ensure the protection of life and the prevention of injuries to the miners exposed to such underground blasting.

(b) The District Manager may permit the firing of more than 20 boreholes of permissible explosives in a round where he has determined that it is necessary to reduce the overall hazard to which miners are exposed during underground blasting. He may also permit the use of nonpermissible blasting units if he finds that a permissible blasting unit does not have adequate blasting capacity and that the use of such permissible units will create any of the following development or construction hazards:

(1) Exposure to disturbed roof in an adjacent cavity while scaling and supporting the remaining roof prior to wiring a new series of boreholes;

(2) Exposure to underburden boreholes where prior rounds have removed the burden adjacent to a remaining borehole;

(3) Exposure to an unsupported roof while redrilling large fragmented roof rock following the loss of predrilled boreholes during earlier blasting operations; or

(4) Any other hazard created by the use of permissible blasting units during underground development or construction.

(c) Permits shall be issued on a mine-by-mine basis for periods of time to be specified by the District Manager.

(d) Permits issued under this section shall specify and include as a condition of their use, any safeguards, in addition to those proposed by the operator, which the District Manager issuing such permit has determined will be required to ensure the welfare of the miners employed in the mine at the time of the blasting permitted.

(Approved by the Office of Management and Budget under control number 1219-0025)

§ 75.1322 Stemming boreholes

(a) Only noncombustible material shall be used for stemming boreholes.

(b) Stemming materials other than water stemming bags shall be tamped to fill the entire cross sectional area of the borehole.

(c) Stemming material shall contact the explosive cartridge nearest the collar of the borehole.

(d) Each borehole 4 or more feet deep shall be stemmed for at least 24 inches.

(e) Each borehole less than 4 feet deep shall be stemmed for at least half the depth of the borehole.

(f) When blasting off the solid in bituminous and lignite mines, only pliable clay dummies shall be used for stemming.

(g) The diameter of a water stemming bag shall be within ¼ of an inch of the diameter of the drill bit used to drill the borehole.

(h) Water stemming bags shall be constructed of tear-resistant and flame-resistant material and be capable of withstanding a 3-foot drop when filled without rupturing or developing leaks.

§ 75.1323 Blasting circuits.

(a) Blasting circuits shall be protected from sources of stray electric current.

(b) Detonators made by different manufacturers shall not be combined in the same blasting circuit.

(c) Detonator leg wires shall be shunted until connected into the blasting circuit.

(d) Blasting cables shall be—

(1) Well insulated, copper wire of a diameter not smaller than 18-guage; and

(2) Long enough to permit the round to be fired from a safe location that is around at least one corner from the blasting area.

(e) Blasting cables shall be shunted until immediately before firing, except when testing for circuit continuity.

(f) Wire used between the blasting cable and detonator circuitry shall—

(1) Be undamaged;

(2) Be well insulated;

(3) Have a resistance no greater than 20-guage copper wire; and

(4) Be not more than 30 feet long.

(g) Each wire connection in a blasting circuit shall be—

(1) Properly spliced; and

(2) Separated from other connections in the circuit to prevent accidental contact and arcing.

(h) Uninsulated connections in each blasting circuit shall be kept out of water and shall not contact the coal, roof, ribs, or floor.

(i) When 20 or fewer boreholes are fired in a round the blasting circuit shall be wired in a single series.

(j) Immediately prior to firing, all blasting circuits shall be tested for continuity and resistance using a blasting galvanometer or other instrument specifically designed for testing blasting circuits.

§ 75.1324 Methane concentration and tests.

(a) No shot shall be fired in an area that contains 1.0 volume percent or more of methane.

(b) Immediately before shots are fired, the methane concentration in a working place or any other area where blasting is to be performed, shall be determined by a person qualified to test for methane.

§ 75.1325 Firing procedures.

(a) Shots shall be fired by a qualified person or a person working in the presence of and under the direction of a qualified person.

(b) Only one face in a working place shall be blasted at a time.

(c) Before blasting—

(1) All persons shall leave the blasting area and each immediately adjacent working place where a hazard would be created by the blast, to an area that is around at least one corner from the blasting area;

(2) The qualified person shall ascertain that all persons are a safe distance from the blasting area; and

(3) A warning shall be given and adequate time allowed for persons to respond.

(d) All shots shall be fired promptly, after all persons have been removed to a safe location.

§ 75.1326 Examination after blasting.

(a) After blasting, the blasting area shall not be entered until it is clear of smoke and dust.

(b) Immediately after the blasting area has cleared, a qualified person or a person working in the presence of and under the direction of a qualified person, shall examine the area for misfires, methane and other hazardous conditions.

(c) If a round has partially detonated, the qualified person shall immediately leave the area and no person shall reenter the affected area for at least 5 minutes.

§ 75.1327 Misfires.

(a) When misfires occur, only work by a qualified person to dispose of misfires and other work necessary to protect persons shall be done in the affected area.

(b) When a misfire cannot be disposed—

(1) A qualified person shall post each accessible entrance to the area affected by the hazard of the misfire with a warning at a conspicuous location to prohibit entry; and

(2) The misfire shall be immediately reported to mine management.

§ 75.1328 Damaged or deteriorated explosives and detonators.

(a) Damaged explosives or detonators shall be—

(1) Placed in separate containers constructed of nonconductive and nonsparking materials; and

(2) Removed from the mine or placed in a magazine and removed when the magazine is resupplied.

(b) Damaged detonators shall be shunted, if practicable, either before being removed from the mine or placed in a magazine.

(c) Deteriorated explosives and detonators shall be handled and disposed of in accordance with the instructions of the manufacturer.

[FR Doc. 88-26411 Filed 11-17-88; 8:45 am]

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federal register

Friday
November 18, 1988

Part IV

Department of Defense
General Services Administration
National Aeronautics and Space Administration

48 CFR Parts 14, 15, and 52
Federal Acquisition Regulation (FAR); Commercial Pricing Certificates; Proposed Rule

DEPARTMENT OF DEFENSE

GENERAL SERVICES ADMINISTRATION

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

48 CFR Parts 14, 15, and 52

Federal Acquisition Regulation (FAR); Commercial Pricing Certificates

AGENCIES: Department of Defense (DOD), General Services Administration (GSA), and National Aeronautics and Space Administration (NASA).

ACTION: Proposed rule.

SUMMARY: This proposed rule implements the requirements of Pub. L. 98–577 and Pub. L. 99–591 pertaining to commercial pricing certificates.

DATE: Comments should be submitted to the FAR Secretariat at the address shown below on or before January 17, 1989, to be considered in the formulation of a final rule.

ADDRESS: Interested parties should submit written comments to: General Services Administration, FAR Secretariat (VRS), Washington, DC 20405. Please cite FAR Case 85–32 in all correspondence related to this issue.

FOR FURTHER INFORMATION CONTACT: Margaret A. Willis, FAR Secretariat, Room 4041, GS Building, Washington, DC 20405, (202) 523–4755.

SUPPLEMENTARY INFORMATION:

A. Background

On July 3, 1985 (50 FR 27560), FAC 84–10, Item III, Certificate of Commercial Pricing, was published as an interim rule implementing Pub. Laws 98–577 (applicable to the civilian agencies) and 98–525 (applicable to DOD, NASA, and the Coast Guard) requiring that acquisitions of commercial items be subject to a certification regarding the lowest price charged the public for items. Subsequently, the FY '87 DoD Appropriations Act, Pub. L. 99–591, made changes to the statutory coverage applicable to DoD, NASA, and the Coast Guard.

The FAR revisions included in this proposed rule implement Pub. Laws 98–577 and 99–591 now codified at 41 U.S.C. 253e and 10 U.S.C. 2323, respectively, and are applicable to all agencies. Under the proposed coverage, offerors/contractors in certain noncompetitive acquisitions are required to certify that the prices offered to the Government for spare or repair parts that the contractor also offers for sale to the general public are no higher than the lowest commercial price at which such parts were sold during the most recent regular period of not less than 30 days duration, or submit a written justification of the difference. The final rule, which will be developed after consideration of the public comments received from this notice of proposed rule, will rescind the interim rule and the DFARS coverage published in the **Federal Register** on June 1, 1988 (53 FR 19960).

B. Regulatory Flexibility Act

The proposed rule adds FAR 14.214, amends 15.813, revises the clause at 52.215–32, and adds the clause at 52.215–35 to implement Pub. Laws 98–577 and 99–591. Under the new coverage, offerors/contractors in certain noncompetitive acquisitions are required to certify that the prices offered for spare or repair parts that the contractor offers for sale to the general public are no higher than the lowest commercial price at which such parts were sold during the most recent regular monthly, quarterly, or other period of not less than 30 days in duration for which sales data are reasonably available. Such coverage is not expected to have a significant impact on a substantial number of small entities because the information required should be readily available to small businesses since they are less likely to have decentralized sales records and the large volume of sales transactions normally associated with larger businesses. However, an Initial Regulatory Flexibility Analysis (IRFA) has been prepared and will be provided to the Chief Counsel for Advocacy of the Small Business Administration. A copy of the IRFA may be obtained from the FAR Secretariat. Comments are invited from small businesses and other interested parties. Comments from small entities concerning the affected FAR Subpart will also be considered in accordance with section 610 of the Act. Such comments must be submitted separately and cite FAR Case 88–610 in correspondence.

C. Paperwork Reduction Act

The Paperwork Reduction Act (Pub. L. 96–511) is deemed to apply because the proposed rule contains information collection requirements. Accordingly, a request for approval of a new information collection requirement concerning Certification of Commercial Pricing is being submitted to the Office of Management and Budget under 44 U.S.C. 3501, et seq. Public comments concerning this request will be invited through a subsequent **Federal Register** notice.

List of Subjects in 48 CFR Parts 14, 15, and 52

Government procurement.

Dated: November 14, 1988.

Harry S. Rosinski,

Acting Director, Office of Federal Acquisition and Regulatory Policy.

Therefore, it is proposed that 48 CFR Parts 14, 15, and 52 are amended as set forth below:

1. The authority citation for 48 CFR Parts 14, 15, and 52 continues to read as follows:

Authority: 40 U.S.C. 486(c); 10 U.S.C. Chapter 137; and 42 U.S.C. 2473(c).

PART 14—SEALED BIDDING

2. Section 14.214 is added to read as follows:

14.214 Commercial pricing certificates.

Sealed bid acquisitions of parts or components as defined in 15.813–2 are subject to the requirements of 15.813, Commercial Pricing Certificates, including the solicitation provisions and contract clause prescription in 15.813–7, when conditions specified therein are applicable.

PART 15—CONTRACTING BY NEGOTIATION

3. Sections 15.813 through 15.813–7 are revised to read as follows:

Sec.

15.813 Commercial pricing certificates.
15.813–1 Scope and applicability.
15.813–2 Definitions.
15.813–3 Policy.
15.813–4 Requirements for submission of commercial pricing certificates.
15.813–5 Exemption from the requirement to submit commercial pricing certificates.
15.813–6 Procedures.
15.813–7 Solicitation provision and contract clause.

Authority: 40 U.S.C. 486(c); 10 U.S.C. Chapter 137; and 42 U.S.C. 2473(c).

15.813 Commercial pricing certificates.

15.813–1 Scope and applicability.

This section prescribes policies and procedures for obtaining certificates from contractors relating to prices offered for parts or components as defined in 15.813–2. It implements the statutory provisions in 41 U.S.C. 253e for civilian agencies and 10 U.S.C. 2323 for the Department of Defense, the National Aeronautics and Space Administration, and Coast Guard.

15.813–2 Definitions.

"Lowest commercial price," as used in this section, means the lowest price at which a sale was made to the general public of a particular part or component.

The term does not include the price at which a sale was made to—

(a) Any agency of the United States;

(b) Customers located outside the United States;

(c) A subsidiary, affiliate, or parent business organization of the contractor or any other branch of the same business entity; and

(d) For contracts awarded by the Department of Defense, the National Aeronautics and Space Administration, and the Coast Guard, such term also does not include the sale to any customer—

(1) For resale after such customer performs a service or function in connection with such part or component that increases the cost of the part or component unless the agency procuring the part or component can demonstrate that the agency is procuring the part or component before such service or function has been performed by any such customer (see 15.813–6(c)); or

(2) At a price that, for the purpose of making a donation, has been substantially discounted below the fair market value or regular price of such part or component.

"Part or component," as used in this section, means—

(a) For acquisitions of the Department of Defense, the National Aeronautics and Space Administration, and the Coast Guard, any individual piece, part, subassembly, or component which is furnished for the logistic support or repair of an end item and not as an end item itself; or

(b) For acquisitions of civilian agencies other than the National Aeronautics and Space Administration and the Coast Guard, any individual part, component, subassembly, assembly, or subsystem integral to a major system, and other property which may be replaced during the service life of the system, and includes spare parts and replenishment spare parts, but does not include packaging or labeling associated with shipment or identification of a part or component.

15.813–3 Policy.

Contracts entered into using other than full and open competition may not result in prices for parts or components (as defined in 15.813–2) offered for sale to the public that exceed the contractor's lowest commercial prices for such parts or components unless the price difference is clearly justified by the seller or the contracting officer has determined to exempt the contractor from the requirement under 15.813–5(d). To this end, 41 U.S.C. 253e and 10 U.S.C. 2323 require offerors to certify that prices offered for parts or components are not more than their lowest commercial prices, or to submit a written statement specifying the amount of the difference between their lowest commercial prices for the parts or components and the prices offered, and providing justification for those differences. Because the forces of the competitive marketplace should ensure that the Government does not pay too high a price for commercial parts or components, commercial pricing certificates are necessary only when these forces are not present in a particular contract action.

15.813–4 Requirements for submission of commercial pricing certificates.

Unless a contract is exempt from the requirement pursuant to 15.813–5, commercial pricing certificates are required to be submitted with any offer/proposal that:

(a) Includes any parts or components that are offered for sale to the public, and

(b) Is submitted in connection with any of the following:

(1) Offers/proposals in connection with contracts to be awarded without full and open competition.

(2) Contract modifications, including contract modifications for additional parts or components, but not including contract modifications that are within the scope and under the terms of the contract, such as contract modifications issued pursuant to the Changes clause (but see subparagraph (b)(5) of this subsection), or funding and other administrative modifications.

(3) Orders under the provisioning line item of a contract, a basic ordering agreement, or similar arrangement if the order is being placed without full and open competition.

(4) Definitization of price on a letter contract, unpriced order, or other contract, modification, or order awarded without a definitive price. (The commercial pricing certificate is not required before the initial award, but rather shall be submitted with the proposal to definitize.)

(5) Any modification issued pursuant to the Changes clause that results in the providing of new or different parts or components.

15.813–5 Exemption from the requirement to submit commercial pricing certificates.

A contract is exempt from the requirement that a commercial pricing certificate be submitted if—

(a) The simplified small purchase procedures of Part 13 are used;

(b) An acquisition is being made under the procedures established by the General Services Administration for its multiple award schedule program; or

(c) An order is placed under an indefinite delivery type contract (a certificate is required in connection with the award without full and open competition of an indefinite delivery type contract); or

(d) The contracting officer determines that obtaining the commercial pricing certificate is not appropriate because of—

(1) National security considerations; or

(2) Significant differences between the terms of the commercial sales of the parts or components to be acquired under the contract and the terms of the contract including differences in quantity, quality, delivery requirements, or other terms and conditions.

15.813–6 Procedures.

(a) If a commercial pricing certificate is required in accordance with 15.813–4, the contracting officer shall ensure that the certificate set forth in paragraph (b) of the clause at 52.215–32, Certificate of Commercial Pricing for Parts or Components, is submitted with each offer/proposal. Notice of the requirement and requests for submission of a certificate in the solicitation is accomplished through use of the solicitation provision at 52.215–35. Contracting officers are encouraged to enter into advance agreements with contractors to consolidate submission requirements when detailed repetitive certifications and justifications would otherwise be required.

(b) When requested pursuant to paragraph (a) of this subsection, offerors/contractors are required to submit the commercial pricing certificate with their proposals unless the contracting officer determines to grant an exemption pursuant to 15.813–5(d). Exemptions from the requirement to submit a commercial pricing certificate should not be granted pursuant to 15.813–5(d)(2) unless the contracting officer has sufficient information to verify that the contractor's lowest commercial price for parts or components offered for sale to the public are subject to such substantial differences (in quantity, quality, delivery, or other terms and conditions) from Government contract terms so as to warrant the exemption. If the contracting officer determines that use of the lowest commercial price for a part or component is not appropriate for a contract under 15.813–5(d), this determination should be communicated to the offeror/contractor in writing. Contracting officers may accept

information supporting possible exemptions from offerors/contractors at any time prior to agreement on price. Exemptions relieve the offerors/contractors from the statutory and contractual submission requirement.

(c) For the Department of Defense, the National Aeronautics and Space Administration, and the Coast Guard, a contracting officer may make a determination that the definition of "Lowest Commercial Price" in the clause at 52.215–32 shall include the price at which a sale was made to any person or corporation for resale by the person or corporation. In making this determination, the contracting officer must be able to demonstrate that the parts or components are being procured by the contracting officer under the same terms and conditions at which a sale was made to the person or corporation for resale.

(d) The contracting officer shall request submission of a new certificate when the validity of the certificate originally submitted with an offer/proposal becomes doubtful before award because of submission of a new or revised proposal or as a result of discussions.

(e) If, after award, the contracting officer learns or suspects that a certificate was inaccurate, incomplete, or misleading, the contracting officer shall request an audit under the authority of paragraph (c) of the clause at 52.215–32. If the contracting officer determines that a certificate is inaccurate, incomplete, or misleading, the Government is entitled to a price adjustment for any overcharge (see paragraph (d) of the clause at 52.215–32).

(f) Individual or class determinations made under 15.813(d) (1) or (2), and advance agreements made under paragraph (a) of this subsection, shall be documented in the contract file.

(g) Possession of a commercial pricing certificate is not a substitute for examining a contractor's proposal and determining that the prices offered are fair and reasonable. The certificate represents a tool to assist the contracting officer in the determination. The contracting officer shall obtain sufficient information with regard to commercial parts or components to permit an understanding of the contractor's commercial pricing structure and where within that structure the acquisition fits. (See 15.804–3(h) and data obtained on the Standard Form 1412, Claim for Exemption from Submission of Certified Cost or Pricing Data.)

15.813–7 Solicitation provision and contract clause.

(a)(1) The contracting officer shall insert the clause at 52.215–32, Commercial Pricing Certificate for Parts or Components, in solicitations and contracts if a commercial pricing certificate is required by 15.813–4.

(2) For civilian agencies other than the National Aeronautics and Space Administration and the Coast Guard, the contracting officer shall insert the clause with its Alternate I in solicitations and contracts involving the furnishing of parts or components using full and open competition.

(b) The contracting officer shall insert the provisions at 52.215–35, Commercial Pricing Certificate—Notice, in solicitations if a commercial pricing certificate is required by 15.813–4.

PART 52—SOLICITATION PROVISIONS AND CONTRACT CLAUSES

4. Section 52.215–32 is revised to read as follows:

52.215–32 Certification of commercial pricing for parts or components.

As prescribed in 15.813–7(a), insert the following clause:

CERTIFICATION OF COMMERCIAL PRICING FOR PARTS OR COMPONENTS (NOV 1988)

(a) *Definitions.*

"Lowest commercial price," as used in this section, means the lowest price at which a sale was made to the general public of a particular part or component. The term does not include the price at which a sale was made to—

(1) Any agency of the United States;

(2) Customers located outside the United States;

(3) A subsidiary, affiliate, or parent business organization of the contractor, or any other branch of the same business entity; and

(4) For acquisitions of the Department of Defense, the National Aeronautics and Space Administration, and the Coast Guard, such term also does not include the sale to any customer—

(i) For resale after such customer performs a service or function in connection with such part or component that increases the cost of the part of component unless the agency procuring the part or component can demonstrate that the agency is procuring the part or component before such service or function has been performed by any such customer (see 15.813–6(c)); or

(ii) At a price that, for the purpose of making a donation, has been substantially discounted below the fair market value or regular price of such part or component.

"Part or component," as used in this section, means—

(1) For acquisitions of the Department of Defense, the National Aeronautics and Space Administration, and the Coast Guard, any individual piece, part, subassembly, or component which is furnished for the logistic support or repair of an end item and not as an end item itself; or

(2) For acquisitions of civilian agencies other than the Coast Guard and the National Aeronautics and Space Administration, any individual part, component, subassembly, assembly or subsystem integral to a major system, and other property which may be replaced during the service life of the system, and includes spare parts and replenishment spare parts, but does not include packaging or labeling associated with shipment or identification of a part or component.

(b) *Submission requirements.* The Offeror/Contractor shall execute and submit to the Contracting Officer the following certificate with any offer/proposal as required by FAR 15.813–4 when requested by the Contracting Officer:

CERTIFICATE OF COMMERCIAL PRICING FOR SUPPLIES

(1) Unless justified in subparagraph (b)(2) of this clause, by submission of this offer/proposal, the Offeror/Contractor certifies that, to the best of its knowledge and belief, the prices offered for those parts or components (whether or not separately identified) that the Contractor offers for sale are no higher than the lowest commercial price at which such items were sold to the public during the most recent regular monthly, quarterly, or other period for which sales data are reasonably available, *provided* that in no event shall this period be less than 30 days in duration.

(2) All parts or components for which prices offered are higher than the lowest commercial price referred to in subparagraph (b)(1) of this certificate are identified below (including the amounts by which such offered prices are higher) and a written justification for the differences is attached:

Part or Component _____

Price Difference _____

(List as necessary)

Offer/Proposal No. _____

Time period for sale data _____

Firm _____

Typed name and signature _____

Title _____

Date _____

(End of certificate)

(c) *Audit.* The Contracting Officer or representatives of the Contracting Officer who are employees of the Government shall have the right to examine and audit all directly pertinent records of sales and related documents, including contract terms and conditions, necessary to verify the validity of any certificate executed in accordance with paragraph (b) of this clause. The Contractor shall make those records, books, data, and documents available for examination, audit, or reproduction until 3 years after the date the certificate set forth in paragraph (b) of this clause is executed. Nothing contained in this clause shall require the submission of cost or pricing data not otherwise required by law or regulation.

(d) *Price reduction.* If any price, including profit or fee negotiated in connection with this contract, or any cost reimbursable under

this contract, has increased because the certification in subparagraph (b)(1) of the certificate or the information provided as justification in subparagraph (b)(2) of the certificate was inaccurate, incomplete, or misleading, the price or cost shall be reduced accordingly and the contract shall be modified to reflect the reduction.

(End of clause)

Alternate I (Nov 1988) As prescribed in 15.813-7(a)(2), insert the following paragraph in the clause without a paragraph identifier, before paragraph (a) of this clause:

The requirements of this clause shall become operative only for any modifications to this contract involving the furnishing of parts or components, as defined in paragraph (a) of this clause, if awarded as a result of other than full and open competition.

5. Section 52.215-35 is added to read as follows:

52.215-35 Commercial pricing certificate—notice.

COMMERCIAL PRICING CERTIFICATE—NOTICE (NOV 1988)

Line Items _____ of this solicitation are parts or components to be acquired under conditions that require the submission of a commercial pricing certificate. The Offeror shall comply with the provision of this solicitation, 52.215-32, Certification of Commercial Pricing for Parts or Components, and execute and submit a certificate with its offer.

(End of provision)

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federal register

Friday
November 18, 1988

Part V

Department of the Interior

Bureau of Land Management

43 CFR Part 3160

Onshore Oil and Gas Operations; Federal and Indian Oil and Gas Leases; Drilling Operations; Final Rule

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

43 CFR Part 3160

[AA-630-87-4111-02; Circular No. 2613]

Onshore Oil and Gas Operations; Federal and Indian Oil and Gas Leases; Onshore Oil and Gas Order No. 2, Drilling Operations

AGENCY: Bureau of Land Management, Interior.

ACTION: Final rulemaking.

SUMMARY: This final rulemaking provides for the issuance of Onshore Oil and Gas Order No. 2 under the provisions of 43 CFR Subpart 3164. This order implements and supplements the requirements found in 43 CFR Subpart 3160 as they apply to drilling operations, specifically, those requirements found at §§ 3162.3–1, 3162.3–4, 3162.4–1, 3162.4–2, 3162.5–1, 3162.5–2, and 3162.5–3. This Order addresses the Bureau of Land Management's uniform national standards for the minimum levels of performance expected from lessees and operators when conducting drilling operations on Federal and Indian (except Osage Tribe) lands. The Order also details enforcement actions and prescribes the manner in which variances may be obtained from specific standards. The Bureau's specific existing internal guidelines on the subject of drilling operations have never been published formally in a Notice to Lessees and Operators, so that this Order has no direct predecessor.

EFFECTIVE DATE: December 19, 1988.

ADDRESS: Inquiries or suggestions should be sent to: Director (610), Bureau of Land Management, Room 601, Premier Building, 1800 C Street NW., Washington, DC 20240.

FOR FURTHER INFORMATION CONTACT: Howard A. Lemm, (801) 524–3000 or Robert Kent, (202) 653–2174.

SUPPLEMENTARY INFORMATION: Section 3164.1 of 43 CFR Part 3160 provides for the issuance of Onshore Oil and Gas Orders when needed to implement and supplement the regulations in that part. All Orders are promulgated through the rulemaking process and, when issued in final form, apply on a nationwide basis. This final rulemaking contains such an Order, No. 2, Drilling Operations.

This Order establishes specific and detailed requirements along with minimum standards covering well control during drilling, casing and cementing, drilling mud and the circulating system, drill stem testing, special drilling operations, related surface use, and the abandonment of drilling operations. These operation standards will be used in conjunction with the broad requirements of Part 3160 and Onshore Oil and Gas Order No. 1. This Order also classifies all violations as minor or major. In addition, the Order establishes the process for initially classifying a violation as minor and reissuing the violation as major if not corrected and continued drilling has increased the adverse impact.

This Order sets standards designed to be minimums for drilling operations at specific pressures under differing conditions and in different parts of the country. It is recognized that, under some conditions, additional requirements will be routinely imposed, or general variances to specific requirements will be granted, either in approval documents or on a field basis. In some instances, the Order relies on existing standards prepared by the American Petroleum Institute, the Occupational Safety and Health Administration, the Texas Railroad Commission, and other agencies. These standards are generally accepted in the oil and gas industry.

The proposed rulemaking for this Onshore Oil and Gas Order No. 2 was published in the **Federal Register** on August 13, 1987 (52 FR 30310). The comment period ended on October 13, 1987. A total of 36 comments were received: 24 from business entities, 8 from offices of Federal agencies, 2 from trade associations, 1 from an Indian tribe, and 1 from an individual. The comments are discussed in the appropriate portions of this preamble where the provisions of the Order they relate to are discussed.

Discussion of II Definitions

The proposed Order defined the term "freeboard". This term has been removed from the final rulemaking because the only reference to it was in the provision on minimum standards for surface use, which has also been removed from the final rulemaking as explained elsewhere in this preamble.

The term "function test" has been changed to "functionally operated" for clarification. At the suggestion of a comment, the word "wellbore" has been added to describe the type of pressures under discussion.

The term "H_2S trim" was removed in the final rulemaking since the final rulemaking now contains no reference to this term.

Several comments suggested changes to the term and definition for "High Pressure Zone" to include low pressure or lost circulation zones. This term has been replaced throughout the Order by "Abnormal Pressure Zone", which refers to low pressure as well as high pressure, and the definition modified to reflect this distinction.

The term "fresh water" has been removed from the Definitions and replaced by the term "usable water" wherever it occurred in the text. This Order requires the protection of usable water, which includes fresh water. The standard for "usable water" of 10,000 ppm. of total dissolved solids is based on the regulatory definition by the Environmental Protection Agency of "drinking water" at 40 CFR 144.3.

A new definition for the term "lessee" is incorporated in this final rulemaking to reflect a change in definition of the term in 43 CFR Part 3160 since the Draft Order was published for comment.

Several comments on the definition of "mud for plugging purposes" suggested that it too restrictive. By using this term, the proposed Order did not intend to exclude the use of other materials. Therefore, the final rulemaking has adopted these comments and the definition has been expanded to include other materials. Consultation with the authorized officer is encouraged to determine the need for mud for plugging purposes to assure that usage is consistent with environmental concerns and established operating practices.

The term "neat cement" does not appear in the final rulemaking, and the term has been removed from the definitions.

The definition for "tagging the plug" has been modified at the suggestion of comments to remove the reference to an amount of weight not to be exceeded when placing the weight of the drill pipe on the plug. This modification was made because no real purpose was served by placing a maximum on the amount of weight placed on the plug.

At the suggestion of a comment, the definition for "targeted tee or turn" has been modified slightly for increased clarity.

The definition of "test plug" is also amended for clarity.

The term "exploratory well" has been redefined to improve the description of what constitutes an exploratory (wildcat) well.

Seven additional terms have been added to the Definitions section in this final rulemaking in response to comments received. The definition chosen for each of these terms was either as defined by a referenced regulation or, when this was not the case, generally by the most commonly used definition incorporating oil field vernacular.

Discussion of III Requirements

A comment was received requesting clarification of the introductory portion of each "Requirement" section and the specific minimum standards that are then listed below each of these requirement sections. The purpose of the Requirements section is to provide direction as to what is to be included in the Application for Permit to Drill (APD), as well as to provide general direction as to the applicability of the minimum standards that follow each of these sections. Neither the Requirements sections nor the Minimum Standards sections are intended to stand alone. However, each section has been reviewed, and clarification added as appropriate.

A. Well Control Requirements

This portion of the rulemaking contains perhaps the most detailed and technical section of the Onshore Order for Drilling Operations. The principal reason for this is the need to establish minimum standards by pressure rating the equipment being utilized. Therefore, even though there is duplication in some of the minimum standards as they uniformly apply to 2M, 3M, 5M, and 10M and 15M systems, substantial differences in usage of equipment require each pressure rating to be listed separately.

A comment requested a definition of the term "operational" used in section III A.1. A definition for this term has been included in the final rulemaking in the Definitions section.

Other comments were received on this same section (III.A.1.) concerning the criteria for establishing the pressure rating of the well control equipment to be used. In the draft order these criteria were established "assuming no fluid (except gas) in the hole". The oil industry comments received on this section were critical of the criteria as being too restrictive and suggestive of a worst-case scenario. While a worst-case scenario represents a legitimate method, used by a number of regulatory agencies and energy companies in developing their design criteria for well control, a compromise has been adopted in the final rulemaking because assuming a totally evacuated hole (except gas) is too extreme to use for establishing minimum standards.

The compromise wording adopted assumes a "partially evacuated hole with a pressure gradient of 0.22 psi/ft." as the criteria for system design. This adopted pressure gradient parameter assumes a partially evacuated hole whereby the hydrostatic pressure gradient is approximately double that assumed in the draft order. It also represents approximately one-half the hydrostatic pressure of a column of water. In addition to being an easily remembered specification, it also represents an appropriate compromise and a legitimate minimum design criterion.

A comment was received concerning section III.A.2. suggesting that the Order should establish well control training provisions. Although this concept has merit, well control training for operators is not within the identified scope of this rulemaking and accordingly is not addressed here. However, this comment has been referred to appropriate BLM personnel for separate consideration.

Minimum standard III.A.i. has been editorially modified for clarity by adding the words "well control" in describing the device required as suggested in the comments received.

The minimum standard III.A.ii. for 2M systems has been modified as suggested in comments to clarify that an "annular preventer, double ram or two rams with one being a blind and one being a pipe ram," is required. This was the intention of the minimum standard contained in the draft Order, but as written could have been understood to require 4 rams, with 1 being a double, and including a blind and a pipe ram as well.

The minimum standard for III.A.iii. received several comments. Some of these noted that 3M systems are the ones most commonly available in some regions. Their use, it was noted, was predicted on availability rather than necessity. Compliance with the provisions of this Order is considered a minimum requirement. As stated in I.D.1., higher rated equipment may be used to meet and maintain these standards without being held to the higher standards normally applied to such equipment. Therefore, if the pressure expected is in the 2M category, the operator should state this in the application. The use of equipment of a higher pressure rating than that approved does not subject the operator to the specifications for the higher pressure rated equipment. Operators are reminded to base requests or equipment approval on this understanding. Since I.D.1. clearly addresses the above mentioned concerns, no further explanation or modification was deemed necessary in the text of the final rulemaking. It should be noted that if drilling were to occur in an area where a 2M system was appropriate and approved, the use of a 3M system without, for example, an annular preventer (which is not required in a 2M system) is, of course, fully acceptable. Accordingly, along with the more liberal assumption of a .22 psi/ft fluid in the hole rather than fully evacuated, as explained earlier, the standard is now appropriate without further modification and as such is consistent with API RP53.

Another comment on this section addressed the draft minimum standard for a drilling spool with side outlet connections. The comment stated that this was too restrictive because the blowout preventer (BOP) itself could have side outlets and functions in the same manner as the drilling spool. The final rulemaking has been modified to allow for this type of equipment and usage not only for a 3M system but for higher rated pressure systems as well.

The minimum standard in the final rulemaking for 2 kill line valves was modified from the draft as suggested by a comment to permit one of the two valves to be a check valve to clarify the intent of the Order.

The minimum standard for safety valves and subs was modified as suggested by comments to clarify intent and now reads "safety valve and subs to fit all drill string connections in use". This has been modified similarly in the requirements for higher rated systems as well.

The term "BOPE" was added to the minimum standard for clarification. It now reads, "All BOPE connections subject to well pressure shall be flanged, welded, or clamped." Connections not subjected to well pressure in the cellar, for example, or those connections upstream from check valves, etc., could be hammer unions as some comments suggested. The minimum standard addresses only those connections directly subject to well pressure conditions. This same modification has been made to the minimum standards for higher rated systems.

The minimum standards for 5M systems in section III.A.iv. generated numerous comments, many of which addressed similar items and nearly all of which suggested minor changes for clarity. As noted below, these changes were for the most part incorporated in this final rulemaking.

The second item in the minimum standards for 5M systems has been completely reworded at the suggestion of comments and broken into 2 separate standards to improve clarity and expound the original intent concerning the appropriate usage of a second pipe ram.

The use of remote kill line on a 5M system received several conflicting comments. This minimum standard is retained as proposed, because it reflects an appropriate and necessary minimum standard.

Comments were received suggesting that the minimum standard in the draft requiring an inside BOP or float sub was not appropriate and did not represent a true minimum standard. The requirement has not been removed, because having an inside BOP or float sub on site that will fit the drill string is standard procedure and necessary to prevent blowouts. However, this standard has been amended to apply specifically to drill string connections in use rather than the entire string.

The minimum standards for 10M and 15M systems in section III.A.2.a.v. received general comments expressing satisfaction with all the specified standards as being appropriate and necessary given the high relative pressures under consideration. However, other useful comments were received as discussed below which addressed issues that warranted further consideration.

The minimum standard for a rotating head if conditions warrant as required in the draft Order was removed since it was not stated as a true minimum standard. The authorized officer at the time the APD is approved always has the discretionary authority to require additional equipment if conditions warrant.

Two comments addressed the minimum standard that requires "3 chokes, 1 being remotely controlled." This standard remains as stated in the draft Order since this requirement is well-accepted operating practice and represents an appropriate minimum standard.

The requirement for a wear ring received several comments. These ranged from the belief that a wear ring is appropriate for all pressure systems to the belief that a wear ring is inappropriate for any system. The minimum standard for a wear ring on 10M and 15M systems has been retained in the final rulemaking in realization that detecting significant wear particularly in these higher rated systems is directly related to responsible well control equipment requirements.

The minimum standard in paragraph III.A.2.a.vii. attracted 1 comment suggesting different wording to recognize the existence of alternative measures that would satisfy the intent of the standard. This minimum standard has been modified to accommodate this request.

The minimum standard in paragraph III.A.2.b.i. generated several comments, some of which suggested that the choke lines should be anchored. This requirement has been included in the final rulemaking. This minimum standard also received comment concerning the requirement that the lines be straight unless turns use tee blocks or are targeted with running tees. This part of the minimum standard was not further modified since it represents an appropriate minimum standard consistent with established operating practice. Operators are reminded that if an instance occurs whereby a legitimate exception to this practice is necessary a variance can be requested as explained elsewhere in this Order.

Several comments were received concerning paragraph III.A.2.b.ii., which relates to the choke manifold equipment configurations. This standard was modified for clarity to improve the original intended meaning. Several valves as shown on the drawing have been removed or their size reduced as suggested in comments since they did not serve an operational purpose and, therefore, were not true minimum standards. Another comment on the choke manifold system urged that wording should be incorporated to state that the system should be kept from freezing. Since the Order requires that all equipment shall be "operational", which includes keeping components from freezing or from being affected by any other factors that would render them non-operational, no greater specificity in this regard is necessary.

As requested in comments, the requirements of this subpart have been clarified by the addition of minimum standards III.A.2.b.iii. and III.A.2.b.iv. These paragraphs more clearly specify the intent of the Order relating to unrestricted flow for valve lines, and the design for pressure gauges.

The pressure accumulator system minimum standards for 3M systems in section III.A.2.c.ii. attracted several general and somewhat divergent comments. No consensus or necessity for modification was expressed, and the final rulemaking in this section remains unchanged.

The minimum standards for 5M accumulator systems in section III.A.2.c.iii. received several comments stating that, as worded, the standards were excessive. The compromise wording adopted attempts to address the concerns of the comments. However, the 50 percent safety factor for 3 ram systems is retained after a review of manufacturers' recommendations as well as industry recommended practices since 5M and higher pressure rated systems typically require more stored volume due to higher BOP stacks, more piping length, etc.

Paragraph III.A.2.f. was amended to reflect suggestions in several comments offering improved language to clarify the minimum standard for accumulator pump capacity in accordance with conventional use. Under the revised minimum standard, the accumulator system is to be isolated rather than removed from service for testing the pump. Furthermore, the pumps are required to be capable of obtaining a minimum of 200 psi pressure above the specified accumulator precharge pressure. This change reflects a recognition that the 1200 psi standard in the proposed Order unduly restricted use of lower pressure accumulator systems.

Paragraph III.A.2.g. has been modified to specify how the valve position is to be maintained, as requested in several comments.

Paragraph III.A.2.h. generated several comments requesting modified language. A statement has been added to clarify the intent that remote controls are not required for 2M systems. The requirement for remote controls for 3M systems remains in place. Again, operators are reminded that if a 2M system is adequate under the requirements of this Order, and the use of a 3M system is being used only because of its availability, this should be noted at the time of approval and the request for approval should reflect equipment specified to handle 2M pressure situations. Only the specifications necessary for 2M systems would be enforced.

The minimum standard for well control equipment testing, III.A.2.i.i., received a comment on acceptable test fluids. Clear water or an appropriate clear liquid for subfreezing temperatures with a viscosity similar to water is required by this final rulemaking. Use of a drilling fluid rather than a clear liquid could mask and/or seal small leaks and, therefore, such use is not considered an appropriate practice or minimum standard, and the rulemaking has been amended to specify liquid rather than fluid.

The next provision providing minimum standards and enforcement provisions for well control equipment testing, in section III.A.2.i.ii., received comments that expressed concern as to the period of time to maintain the pressure test. This minimum standard has been amended to effect a compromise between the draft Order and the varying comments received. The final rulemaking specifies that the test shall be maintained for "10 minutes or until the provisions of the test are met, whichever is greater" instead of the 15-minute test period specified in the draft Order. Utilization of a test plug is addressed in the final rulemaking along

with accompanying provisions for its pressure testing.

The length of test specified in III.A.2.i.iii. was similarly modified to "10 minutes or until provisions of the test are met".

Language in III.A.2.i.iv.B. is amended to make it clear that the test is to be performed when any seal subject to test pressure is broken.

Minimum standard III.A.2.i.vii is amended to require that the annular preventer shall be functionally operated at least weekly in order to determine whether the equipment is in working order without subjecting it to well bore pressures. This requirement would not significantly damage or cause premature wear of the rubber element.

The minimum standard III.A.2.i.ix. was amended for clarity to include the words "pit level" in describing the blowout prevention equipment (BOPE) drill to be conducted as suggested in a comment. This clarification refers to an exercise to be performed by the rig crew in response to a simulation of a gain in the mud pit level that would indicate an entry of fluid in the well bore.

B. Casing and Cementing Requirements

Many comments were received concerning the provisions for casing and cementing. Although the philosophy of what constitutes good minimum standards varied somewhat throughout these comments, those comments that provided alternative language to accomplish the perceived intent of the drafted standards were especially useful. The efforts of those commentators are especially appreciated in resolving and arriving at the appropriate minimum standards herein incorporated.

Numerous changes in the introductory language that precedes the minimum standards have been made as the result of comments. The draft order inconsistently referred to fresh water zones and to usable water zones needing protection. References to fresh water zones have been replaced with the term "usable water zones" throughout this final rulemaking for consistency and for regulatory compliance since usable water zones, which include fresh water zones, are also required to be protected.

Comments also suggested alternatives to the term "leasable mineral deposits." This term has been replaced as suggested by the term "valuable deposit of minerals" and is redefined as indicated in the definitions.

The criterion for casing setting depth has been revised. The draft criterion attracted more comments than any other single item in the proposed rulemaking. This requirement as it appears in the final rulemaking is consistent with accepted standard field operating practice and establishes the standard for design assuming normal drilling operations and conditions. In this context, the casing would not have to be designed to anticipate a completely unloaded situation down-hole.

The minimum design factors for tension, collapse, and burst have been removed in this final rulemaking, because of the great variations in calculation methods within industry among companies and from region to region. However, the operator will be required to submit the design factors that were utilized in his design for all exploratory wells and/or other wells as specified by the authorized officer.

The casing design factors for formation pressure gradients and fracture gradients attracted several comments. However, since both items occur with a statement "lacking better data", there was a consensus that these criteria are appropriate.

The minimum clearance provision for a hole/casing annulus received considerable comment. The necessity for an acceptable clearance was widely recognized, yet concern was expressed because of drill bit and casing size availability considerations. Several comments included excellent data on commonly accepted hole/casing annulus clearances that are in part derived from drill bit and casing size availability. The most common example cited was the use of 7 inch casing in an 8 1/2 inch hole. This calculates to a 0.422 inch clearance on all sides, which, according to both the comments and further research within BLM, is the "smallest" prudent clearance necessary to provide adequate isolation. Therefore, the final rulemaking establishes 0.422 inch clearance on all sides as the minimum design criterion, replacing 0.500 inch. Some comments strongly suggested that as much as 1 inch on all sides may be necessary, but the final rulemaking establishes a practicable minimum standard. It is recognized that there could be exceptions in unique circumstances when the operator or the authorized officer may wish to vary this requirement. These rare exceptions can be dealt with by requesting or requiring a variance as explained elsewhere in this Order. It should be realized that, as with any minimum standard or requirement, the authorized officer may require an increased clearance depending on field conditions. For example, depending on circumstances, the authorized representative may require additional clearance for surface casing strings.

The "waiting on cement" time requirement drew several comments that differed widely as to the suggested appropriate times. This requirement has been amended to indicate that the time must be adequate to achieve a minimum of 500 psi compressive strength at the casing shoe prior to drilling out. This change was at the suggestion of comments received and represents the generally accepted field operating practice.

The minimum standard for casing in item III.B.1.a. has been amended as suggested in comments to improve clarity and provide for consistency with similar regulatory standards. The standard is strengthened by requiring testing and by requiring reconditioned casing to meet or exceed API standards for new casing.

The minimum standard for liners in paragraph III.B.1.b. attracted comments suggesting the overlap should be as much as 300 feet or as little as 50 feet. Maintaining the minimum standard at 100 feet of overlap was deemed the most appropriate to combine most beneficially safety and economy. Operators are free to exceed this minimum standard.

An additional comment on this section suggested language making it clear when a pressure test for liners should be performed, and setting the standards for such a test. This suggestion has been adopted in the final rulemaking.

At the request of comments, minimum standard III.B.1.e. has been amended to specify that the required report is to be made before running the next string of casing or before requesting plugging orders, whichever occurs first.

The minimum standard in paragraph III.B.1.f. received comments both on the standard for placement of centralizers and on the standard for determining the corrective action. These comments have been adopted. The standards have been amended to improve the likelihood of there being an adequate cement bond.

Minimum standard III.B.1.g. for use of top and bottom plugs was amended to improve clarity and to set forth acceptable alternatives for isolating the cement from contamination.

Minimum standard III.B.1.h. on pressure testing casing strings has been rephrased as suggested by comments in order to clarify the intent as well as the technical reasoning. As published in the proposed rulemaking, the standard for pressure testing—1 psi per foot of casing length—was an error, and the final Order returns to the standard that has been employed historically.

One comment was received suggesting alternative wording to make minimum standard III.B.1.i. on testing the pressure integrity of each casing shoe more flexible to meet varying pressure situations at different depths and in different formations. Recognizing that the well may not require a 5M system until it reaches greater depth, the suggested wording has been adopted. The final Order relaxes the requirement for portions of wells—generally the upper portions—that may not require a 5M system.

C. Mud Program Requirements

One comment was received asking that the term "mudding up" be defined. The final rulemaking includes a definition of this term.

In response to comments, the last sentence of the requirement statement for this section was modified by replacing "and" with "or" in recognition that being relatively near a premix bulk mud supply is a sufficient and acceptable alternative to maintaining sufficient quantities of mud materials on site.

For clarity and at the suggestion of a comment, the word "equipment" has been added to the term "visual mud-monitoring" in minimum standard III.C.2.

Minimum standard III.C.3. of the mud program requirements has been modified as suggested by several comments to require having mud monitoring equipment in place on all systems only when abnormal pressures are anticipated by the operator. A definition of "abnormal pressure" has been added in the definitions section to clarify when the operator is required to have monitoring equipment in place. In exploration areas, applications for permit to drill (APD) will be approved only if they call for monitoring equipment to be in place, because in such situations there can be little or no basis for anticipating normal pressures.

A change in the proposed Order at paragraph III.C.4. on testing for viscosity, density, and gel strength was made in response to comments stating that the Order should specify when it is necessary to begin requiring mud tests. This has been done in the final rulemaking by specifying that after mudding up, the tests should occur every 24 hours.

Several comments were received objecting to the minimum standard III.C.5. on the use of trip tanks. The requirement only applies to 10M, 15M, and upgraded 5M systems. Systems in such high pressure situations are unique by their nature and require special equipment to aid in the detection of kicks. This standard therefore remains unchanged, except that the authorized officer is given discretion, for 5M systems, to require a trip tank if conditions warrant.

Minimum standard III.C.6. on gas detection equipment has been completely rewritten, at the suggestion of one comment, to add a provision for monitoring other hydrocarbon gases, such as methane, as well as hydrogen sulfide. An editorial change was also made to correct the H_2S concentration listed from 100 ppm to 20 ppm.

The language of standard III.C.7. on flare systems has been changed to improve clarity by specifying that flare lines shall be positioned in the prevailing downwind direction from the gas source. In addition, the flare line discharge distance has been changed from 150 feet to 100 feet for consistency with proposed Order 6, which is in preparation, and with standards set by the Occupational Safety and Health Administration.

Standard III.C.8. has been amended to require the installation of a mud-gas separator (gasbuster) as specified at least 500 feet above the anticipated hydrocarbon zone instead of 1,000 feet as stated in the proposed rulemaking, and only for systems of 10M or greater, or those where abnormal pressures are anticipated even if the system is not 10M, rather than for all 5M or greater systems as provided in the proposed rulemaking. Several comments requested this change, which will also be consistent with the proposed Order 6 on H_2S Operations. This approach is more reasonable and flexible. The standard applies only in those discrete areas where separators are most likely to be needed. Additionally, the violation in the final rulemaking is classified as "minor" in recognition that the correction could readily be made before encountering the anticipated hydrocarbon zone.

D. Drill Stem Testing Requirements

A number of comments addressed the proposed prohibition of initiating drill stem testing (DST) outside of daylight hours. This provision has been modified to allow the authorized officer a degree of flexibility in approving DST in recognition that in the northern latitudes and during the winter months, initiation of a DST in daylight may not be practicable. Special safety requirements may be imposed by the authorized officer in those instances. Also, closed chamber DST may be accomplished day or night and provision for this has been added as suggested in comments and to clarify the original intention of the draft.

Standards III.D.1. and D.2. were editorially amended for clarity as suggested in comments.

Standard III.D.3. on the location of combustion engines has been amended to make it consistent with the OSHA requirement that they be located no closer than 100 feet from the well bore, unless equipped with arresters and/or water cooled exhaust manifolds.

E. Special Drilling Operations

Numerous comments were received concerning this section. Many of these addressed the minimum distances specified. In response to these comments, all distances have been standardized and reduced to 100 feet. For example, the length of the blooie line, required to be 150 feet from the well bore in the proposed rulemaking, is now 100 feet. In all cases, the distances specified in this final rulemaking pertaining to Special Drilling Operations are consistent with similar requirements of OSHA.

Another comment suggested modifying the minimum standard concerning the straight run on the blooie line. This has been modified by the addition of the words "unless otherwise approved" because there may be instances where a straight run may not be feasible.

One comment suggested removal of the minimum standard requiring deduster equipment during air/gas drilling. This comment was not adopted due to the potentially serious environmental consequences. If an operator has a special situation and can justify not using deduster equipment, he can request a variance of the authorized representative as detailed elsewhere in this Order.

As suggested in a comment, the minimum standard for containment of cuttings and the circulating medium has been amended to specify the required mode of containment.

Several comments dealt with the draft minimum standard requiring an automatic igniter and a continuous pilot light on the blooie line. This standard has been modified to provide that either of these methods is acceptable rather than both being required. Under certain circumstances the authorized officer may require both in approving a particular APD if redundancy is desirable; however, it is not necessary to require both as a minimum standard.

At the suggestion of several comments, the minimum standard concerning mud mixing equipment, mixing water, etc., was rewording for clarity.

F. Surface Use

Comments from within government and from industry were received concerning the minimum standards portion of the Surface Use Requirements. These comments did not particularly object to the stated minimum standard in the draft, but argued that this Order is not the appropriate place to outline specific surface standards. Several comments suggested that a revision of Onshore Order No. 1 would be more appropriate. BLM has scheduled such a revision to Onshore Order No. 1. In addition, under the Federal Onshore Oil and Gas Leasing Reform Act of 1987, management of surface use on National Forest lands is required to be coordinated with the Forest Service. In response to the comments, the minimum standards portion of the Surface Use Requirements has been modified in this final rulemaking to contain a general standard to comply with the approved APD rather than specific standards.

G. Drilling Abandonment Requirements

Comments received on the drilling abandonment section of this Order are discussed below as they address specific provisions.

Two comments suggested amendment of the provision on types of mineral deposits requiring protection. The term "prospectively valuable deposit of minerals" has been added in the introductory paragraph of this section and to the definitions section of the Order to clarify an unnecessarily vague reference to "other minerals".

Another comment requested that the deadline for following up in writing an oral request for abandonment be increased from 5 business days to 10. This comment has not been adopted because an operator can ask for an extension if additional time is needed.

The minimum standard in paragraph III.G.1.i.a. on migrating fluids was modified as suggested in comments to make it clear that gases as well as liquids are considered fluids with a potential to migrate, and that formations containing them shall be cemented across in the prescribed manner. Another comment on this section wanted the term "fluid" to be defined as fresh water or hydrocarbon. This suggestion was rejected as being too restrictive. For example, salt water or nitrogen gas zones require cementing across so that contamination of other zones by migration does not occur.

The requirement in the draft Onshore Order specifying protection of lost circulation zones during plugging has been removed at the suggestion of comments. However, as stated elsewhere in the Drilling Abandonment Requirements, the hole must be in a static condition at the time any plugs are placed, or the placement of additional plugs and/or cement may be required. Therefore, to assure a static well bore condition, lost circulation zones must be stabilized or isolated in some manner before further plugging can occur higher up in the hole.

The minimum standard in paragraph III.G.1.i.b. was modified as explained earlier in this section to clarify the types of minerals needing protection.

The minimum standard in paragraph III.G.1.ii. attracted comments questioning the reasoning behind the requirement of an additional 10 percent of slurry for each 1,000 feet of depth. This factor is included to compensate for mud contamination (and not as a washout factor as supposed in some comments) in pumping the plug to the required depth. For a 100 foot plug located at 10,000 feet, this would amount to an additional 100 feet of cement column. Similar comments were received concerning this requirement as it applies to cased holes. Since the logic for requiring this additional slurry is the same, those comments are not addressed further in this section.

The minimum standard in paragraph III.G.1.iv. was modified as suggested by comments to make it clear that it pertains to thick sections of a single formation. Another comment on this section preferred that extremely thick sections be defined as being 400 feet in thickness. This suggestion was not adopted because there are too many variables to select a particular number as "extremely thick". The authorized officer and the operator requesting plugging instructions need flexibility in determining whether a portion of a formation is extremely thick.

The minimum standard in paragraph III.G.1.v. on plugging open holes was modified in this final rulemaking as suggested by a comment to recognize that plugs shall be placed across in-gauge sections of the hole every 3,000 feet, unless otherwise approved by the authorized officer. This change will enable the authorized officer the flexibility to modify this requirement on a case-by-case basis.

Two comments addressed the minimum standard in paragraph III.G.2.iii., the amount of cement needed to cap a bridge plug when a bailer is used. The comments suggested 20 feet instead of the proposed 35 feet. The comments were rejected because a lesser amount is not considered adequate. This recognizes a policy based on Bureau of Land Management experience, requiring 35 feet, that has been in place for many years. The requirement of 35 feet is already less than the 50 feet of plug required to cap the bridge plug when not using a bailer.

Paragraph III.G.5. was amended because of a typographical error to require that at least the top 50 feet (instead of 100 feet) of the annulus shall be plugged.

The section on isolating medium, paragraph III.G.6. in this final rulemaking, was modified to clarify the types of minerals requiring protection as explained above. Another comment on this section suggested deleting the 15,000 pound maximum tagging weight provision. This comment was adopted because setting a maximum weight to be used to tag a plug is unncessary.

The minimum standard in paragraph III.G.8. of this final rulemaking has been modified from the draft as suggested by a comment to clarify the cement plug requirement at the surface. This standard now states that the top 50 feet of the hole shall be plugged and removes the reference restricting this plug to the smallest casing extending to the surface. All annuluses within 50 feet of the surface are to be plugged off. Another comment on this provision suggested 100 feet of plug rather than 50 feet. This comment was not adopted because 50 feet is adequate if propoerly placed.

Paragraph III.G.10. concerning the surface cap was modified as suggested by comments to improve the clarity and sequence. Another comment on this minimum standard questioned the purpose of the weep hole. This term is defined and explained in the definitions section.

Discussion of IV Variances From Minimum Standard

The only comments on this section requested the addition of provision for oral variances during emergency situations. The final rulemaking adopts this suggestion, although such requests by the operator are required to be followed up by a written request as specified in the new wording. This change was incorporated in recognition that an emergency or other event that could not have been reasonably foreseen may occur during drilling operations.

Discussion of Attachments

Several comments were received concerning the choke manifold equipment configurations. A statement has been added to each of the pressure systems diagrams in response to the comments to indicate that the configuration of the equipment may

vary. This was the original intent and the addition of the statement improves clarity.

Another comment requested that one of the two valves on the bleed line to the pit be removed from the requirement for equipment for pressure ratings of 3M and above. This comment was adopted for 3M systems, but was rejected for higher rated systems due to the higher pressures involved.

The principal authors of this proposed rulemaking are Howard Lemm of the Utah State Office, Carl Budd of the Rock Springs District Office, Hal Stoops of the Bakersfield District Office, and Bob Kent of the Washington Office, assisted by the staff of the Division of Legislation and Regulatory Management, Bureau of Land Management.

It is hereby designated that this proposed rulemaking does not constitute a major Federal action significantly affecting the quality of the human environment, and that no detailed statement pursuant to section 102(2)(C) of the National Environmental Policy Act of 1969 (42 U.S.C. 4332(2)(C)) is required.

The Department of the Interior has determined that this document is not a major rule under Executive Order 12291 and will not have a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 et seq.).

The information collection requirements contained in 43 CFR Part 3160 have been approved by the Office of Management and Budget under 44 U.S.C. 3501 *et seq.* and assigned clearance numbers 1004–0134 and 1004–0136.

List of Subjects in 43 CFR Part 3160

Government contracts, Mineral royalties, Oil and gas exploration, Oil and gas production, Public lands—mineral resources, Indian lands—mineral resources, Reporting and recordkeeping requirements.

Under the authorities cited below, Part 3160, Group 3100, Subchapter C, Chapter II of Title 43 of the Code of Federal Regulations is amended as set forth below.

October 11, 1988.

J. Steven Griles,

Assistant Secretary of the Interior.

PART 3160—[AMENDED]

1. The authority citation for Part 3160 continues to read:

Authority: The Mineral Leasing Act of 1920, as amended and supplemented (30 U.S.C. 183 et seq.), the Mineral Leasing Act for Acquired Lands of 1947, as amended (30 U.S.C. 351–359), the Act of May 21, 1930 (30 U.S.C. 301–306), the Act of March 3, 1909, as amended (25 U.S.C. 396), the Act of May 11, 1938, as amended (25 U.S.C. 396a–396q), the Act of Feburary 28, 1891, as amended (25 U.S.C. 397), the Act of May 29, 1924 (25 U.S.C. 398), the Act of March 3, 1927 (25 U.S.C. 398a–398e), the Act of June 30, 1919, as amended (25 U.S.C. 399), R.S. 441 (43 U.S.C. 1457), See also Attorney General's Opinion of April 2, 1941 (40 Op. Atty., Gen. 41), the Federal Property and Administrative Services Act of 1949, as amended (40 U.S.C. 471 et seq.), the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.), the Act of December 12, 1980 (42 U.S.C. 6508), the Combined Hydrocarbon Leasing Act of 1981 (Pub. L. 97–78), the Federal Oil and Gas Royalty Management Act of 1982 (30 U.S.C. 1701 et seq.) and the Indian Mineral Development Act of 1982 (25 U.S.C. 2102 et seq.).

2. Section 3164.1(b) is amended by adding the following entry to the table which is part of § 3164.1(b):

§ 3164.1 Onshore oil and gas orders.

* * * * *

(b) * * *

Order No.	Subject	Effective date	Federal Register reference	Supersedes
1	Approval of operations	November 12, 1983	48 FR 48916 and 48 FR 56226	NTL-6
2	Drilling operations			None

Note.—Numbers will be assigned by the Washington Office, Bureau of Land Management, to additional Orders as they are prepared for publication and added to this table.

Note.—This appendix is published for information only and will not appear in the Code of Federal Regulations.

Appendix—Text of Oil and Gas Order No. 2.

Onshore Oil and Gas Order No. 2

Drilling Operations on Federal and Indian Oil and Gas Leases

I. Introduction.
- A. Authority.
- B. Purpose.
- C. Scope.
- D. General.

II. Definitions.

III. Requirements.
- A. Well Control Requirements.
- B. Casing and Cementing Requirements.
- C. Mud Program Requirements.
- D. Drill Stem Testing Requirements.
- E. Special Drilling Operations.
- F. Surface Use.
- G. Drilling Abandonment.

IV. Variances from Minimum Standards.

Attachments.

I. Diagrams of Choke Manifold Requirements.

II. Sections from 43 CFR Subparts 3163 and 3165.

Onshore Oil and Gas Order No. 2

Drilling Operations on Federal and Indian Oil and Gas Leases

I. Introduction

A. Authority

This order is established pursuant to the authority granted to the Secretary of the Interior pursuant to various Federal and Indian mineral leasing statutes and the Federal Oil and Gas Royalty Management Act of 1982. This authority has been delegated to the Bureau of Land Management and is implemented by the onshore oil and gas operating regulations contained in 43 CFR Part 3160. Section 3164.1 thereof specifically authorizes the Director, Bureau of Land Management, to issue Onshore Oil and Gas Orders when necessary to implement and supplement the operating regulations and provides that all such Orders shall be binding on the lessees and operators of Federal and restricted Indian (except Osage tribe) oil and gas leases that have been, or may hereafter be, issued.

Specific authority for the provisions contained in this Order is found at: § 3162.3–1 *Drilling Applications and Plans;* § 3162.3–4 *Well Abandonment;* § 3162.4–1 *Well Records and Reports;* § 3162.4–3 *Samples, Tests, and Surveys;* § 3162.5–1 *Environmental Obligations;* § 3162.5–2 *Control of Wells;* § 3162.5–2(a) *Drilling Wells;* § 3162.5–3 *Safety Precautions;* and Subpart 3163 Noncompliance and Assessment.

B. Purpose

This onshore Order details the Bureau's uniform national standards for the minimum levels of performance expected from lessees and operators when conducting drilling operations on Federal and Indian lands (except Osage Tribe) and for abandonment immediately following drilling. The

purpose also is to identify the enforcement actions that will result when violations of the minimum standards are found, and when those violations are not abated in a timely manner.

C. Scope

This Order is applicable to all onshore Federal and Indian (except Osage Tribe) oil and gas leases.

D. General

1. If an operator chooses to use higher rated equipment than that authorized in the Application for Permit to Drill (APD), testing procedures shall apply to the approved working pressures, not the upgraded higher working pressures.

2. Some situations may exist either on a well-by-well or field-wide basis whereby it is commonly accepted practice to vary a particular minimum standard(s) established in this Order. This situation may be resolved by requesting a variance (See section IV of this Order), by the inclusion of a stipulation to the APD, or by the issuance of a Notice to Lessees and Operators (NTL) by the appropriate BLM office.

3. When a violation is discovered, and if it does not cause or threaten immediate substantial and adverse impact on public health and safety, the environment, production accountability or royalty income, it will be classified as minor. The violation may be reissued as a major violation if not corrected during the abatement period and continued drilling has changed the adverse impact of the violation so that it meets the specific definition of a major violation.

4. This Onshore Order is not intended to circumvent the reporting requirements or compliance aspects that may be stated elsewhere in Existing NTL's, Onshore Orders, etc. A lessee's compliance with the requirements of the regulations in this Part shall not relieve the lessee of the obligation to comply with other applicable laws and regulations in accordance with 43 CFR 3162.5–1(c). Lessee's should give special attention to the automatic assessment provisions in 43 CFR 3163.1(b).

5. This Order is based upon the assumption that operations have been approved in accordance with 43 CFR Part 3160 and Onshore Oil and Gas Order No. 1. Failure to obtain approval prior to commencement of drilling or related operations shall subject the operator to immediate assessment under 43 CFR 3163.1(b)(2).

II. Definitions.

A. Abnormal Pressure Zone means a zone that has either pressure above or below the normal gradient for an area and/or depth.

B. Bleed Line means the vent line that bypasses the chokes in the choke manifold system; also referred to as Panic Line.

C. Blooie Line means a discharge line used in conjunction with a rotating head.

D. Drilling Spool means a connection component with both ends either flanged or hubbed, with an internal diameter at least equal to the bore of the casing, and with smaller side outlets for connecting auxiliary lines.

E. Exploratory Well means any well drilled beyond the known producing limits of a pool.

F. Fill-up Line means the line used to fill the hole when the drill pipe is being removed from the well. It is usually connected to a 2-inch collar that is welded into a drilling nipple.

G. Flare Line means a line used to carry gas away from the rig to be burned at a safer location. The gas comes from the degasser, gas buster, separator, or when drill stem testing, directly from the drill pipe.

H. Functionally Operated means activating equipment without subjecting it to well-bore pressure.

I. Isolating means using cement to protect, separate, or segregate usable water and mineral resources.

J. Lease means any contract, profit-share agreement, joint venture, or other agreement issued or approved by the United States under a mineral leasing law that authorizes exploration for, extraction of, or removal of oil or gas (See 43 CFR 3160.0–5).

K. Lessee means a person holding record title in a lease issued by the United States (See 43 CFR3160.0–5).

L. Make-up Water means water that is used in mixing slurry for cement jobs and plugging operations, and is compatible with the cement constituents being used.

M. Manual Locking Device means any manually activated device, such as hand wheels, etc., that is used for the purpose of locking the preventer in the closed position.

N. Mud for Plugging Purposes means a slurry of bentonite or similar flocculent/viscosifier, water, and additives needed to achieve the desired weight and consistency to stabilize the hole.

O. Mudding Up means adding materials and chemicals to water to control the viscosity, weight, and filtrate loss of the circulating system.

P. Operating Rights Owner (or Owner) means a person or entity holding operating rights in a lease issued by the United States. A lessee also may be an operating rights owner if the operating rights in a lease or portion thereof have not been severed from record title.

Q. Operational means capable of functioning as designed and installed without undue force or further modification.

R. Operator means any person or entity, including but not limited to the lessee or operating rights owner, who has stated in writing to the authorized officer his/her responsibility for the operations conducted in the leased lands or a portion thereof.

S. Precharge Pressure means the nitrogen pressure remaining in the accumulator after all the hydraulic fluid has been expelled from beneath the movable barrier.

T. Prompt Correction means immediate correction of violations, with drilling suspended if required in the discretion of the authorized officer.

U. Prospectively Valuable Deposit of Minerals means any deposit of minerals that the authorized officer determines to have characteristics of quantity and quality that warrant its protection.

V. Tagging the Plug means running in the hole with a string of tubing or drill pipe and placing the weight of that string on the plug. Other methods of tagging the plug may be approved by the authorized officer.

W. Targeted Tee or Turn means a fitting used in pressure piping in which a bull plug or blind flange of the same pressure rating as the rest of the approved system is installed at the end of a tee or cross, opposite the fluid entry arm, to change the direction of flow and to reduce erosion.

X. 2M, 3M, 5M, 10M, and 15M mean the pressure ratings used for equipment with a working pressure rating of the equivalent thousand pounds per square inch (psi) (2M=2,000 psi, 3M=3,000 psi, etc.).

Y. Usable Water means generally those waters containing up to 10,000 ppm of total dissolved solids.

Z. Weep Hole means a small hole that allows pressure to bleed off through the metal plate used in covering well bores after abandonment operations.

III. Requirements

A. Well Control Requirements

1. Blowout preventer (BOP) and related equipment (BOPE) shall be installed, used, maintained, and tested in a manner necessary to assure well control and shall be in place and operational prior to drilling the surface casing shoe unless otherwise approved by the APD. Commencement of drilling without the approved BOPE installed, unless otherwise approved, shall subject

the operator to immediate assessment under 43 CFR 3163.1(b)(1). The BOP and related control equipment shall be suitable for operations in those areas which are subject to sub-freezing conditions. The BOPE shall be based on known or anticipated sub-surface pressures, geologic conditions, accepted engineering practice, and surface environment. Item number 7 of the 8 point plan in the APD specifically addresses expected pressures. The working pressure of all BOPE shall exceed the anticipated surface pressure to which it may be subjected, assuming a partially evacuated hole with a pressure gradient of 0.22 psi/ft.

2. The gravity of the violation for many of the well control minimum standards listed below are shown as minor. However, very short abatement periods in this Order are often specified in recognition that by continuing to drill, the violation which was originally determined to be of a minor nature may cause or threaten immediate, substantial and adverse impact on public health and safety, the environment, production accountability, or royalty income, which would require its reclassification as a major violation.

a. *Minimum standards and enforcement provisions for well control equipment.* i. A well control device shall be installed at the surface that is capable of complete closure of the well bore. This device shall be closed whenever the well is unattended.

Violation: Major.

Corrective Action: Install the equipment as specified.

Normal Abatement Period: Prompt correction required.

ii. 2M system:

—Annular preventer, double ram, or two rams with one being blind and one being a pipe ram *

—Kill line (2 inch minimum)

—1 kill line valve (2 inch minimum)

—1 choke line valve

—2 chokes (refer to diagram in Attachment 1)

—Upper kelly cock valve with handle available

—Safety valve and subs to fit all drill strings in use

—Pressure gauge on choke manifold

—2 inch minimum choke line

—Fill-up line above the uppermost preventer.

Violation: Minor (all items unless marked by asterisk).

Corrective Action: Install the equipment as specified.

Normal Abatement Period: 24 hours.

*Violation: Major.

Corrective Action: Install the equipment as specified.

Normal Abatement Period: Prompt correction required.

iii. 3M system:

—Annular preventers *

—Double ram with blind rams and pipe rams *

—Drilling spool, or blowout preventer with 2 side outlets (choke side shall be a 3-inch minimum diameter, kill side shall be at least 2-inch diameter) *

—Kill line (2 inch minimum)

—A minimum of 2 choke line valves (3 inch minimum) *

—3 inch diameter choke line

—2 kill line valves, one of which shall be a check valve (2 inch minimum) *

—2 chokes (refer to diagram in Attachment 1)

—Pressure gauge on choke manifold

—Upper kelly cock valve with handle available

—Safety valve and subs to fit all drill string connections in use

—All BOPE connections subjected to well pressure shall be flanged, welded, or clamped *

—Fill-up line above the uppermost preventer.

Violation: Minor (all items unless marked by asterisk).

Corrective Action: Install the equipment as specified.

Normal Abatement Period: 24 hours.

* Violation: Major.

Corrective Action: Install the equipment as specified.

Normal Abatement Period: Prompt correction required.

iv. 5M system:

—Annular preventer *

—Pipe ram, blind ram, and, if conditions warrant, as specified by the authorized officer, another pipe ram shall also be required *

—A second pipe ram preventer or variable bore pipe ram preventer shall be used with a tapered drill string

—Drilling spool, or blowout preventer with 2 side outlets (choke side shall be a 3-inch minimum diameter, kill side shall be at least 2-inch diameter) *

—3 inch diameter choke line

—2 choke line valves (3 inch minimum) *

—Kill line (2 inch minimum)

—2 chokes with 1 remotely controlled from rig floor (refer to diagram in Attachment 1)

—2 kill line valves and a check valve (2 inch minimum) *

—Upper kelly cock valve with hand available

—When the expected pressures approach working pressure of the system, 1 remote kill line tested to stack pressure (which shall run to the outer edge of the substructure and be unobstructed)

—Lower kelly cock valve with handle available

—Safety valve(s) and subs to fit all drill string connections in use

—Inside BOP or float sub available

—Pressure gauge on choke manifold

—All BOPE connections subjected to well pressure shall be flanged, welded, or clamped *

—Fill-up line above the uppermost preventer.

Violation: Minor (all items unless marked by asterisk).

Corrective Action: Install the equipment as specified.

Normal Abatement Period: 24 hours.

* Violation: Major.

Corrective Action: Install the equipment as specified.

Normal Abatement Period: Prompt correction required.

v. 10M & 15M system:

—Annular preventer *

—2 pipe rams *

—Blind rams *

—Drilling spool, or blowout preventer with 2 side outlets (choke side shall be a 3-inch minimum diameter, kill side shall be at least 2-inch diameter) *

—3 inch choke line *

—2 kill line valves (2 inch minimum) and check valve *

—Remote kill line (2 inch minimum) shall run to the outer edge of the substructure and be unobstructed

—Manual and hydraulic choke line valves (3 inch minimum) *

—3 chokes, 1 being remotely controlled (refer to diagram in Attachment 1)

—Pressure gauge on choke manifold

—Upper kelly cock valve with handle available

—Lower kelly cock valve with handle available

—Safety valves and subs to fit all drill string connections in use

—Inside BOP or float sub available

—Wear ring in casing head

—All BOPE connections subjected to well pressure shall be flanged, welded, or clamped *

—Fill-up line installed above the uppermost preventer.

Violation: Minor (all items unless marked by asterisk).

Corrective Action: Install the equipment as specified.

Normal Abatement Period: 24 hours.

* Violation: Major.

Corrective Action: Install the equipment as specified.

Normal Abatement Period: Prompt correction required.

vi. If repair or replacement of the BOPE is required after testing, this work shall be performed prior to drilling out the casing shoe.

Violation: Major.

Corrective Action: Install the equipment as specified.

Normal Abatement Period: Prompt correction required.

vii. When the BOPE cannot function to secure the hole, the hole shall be secured using cement, retrievable packer or a bridge plug packer, bridge plug, or other acceptable approved method to assure safe well conditions.

Violation: Major.

Corrective Action: Install the equipment as specified.

Normal. Abatement Period: Prompt correction required.

b. *Minimum standards and enforcement provisions for choke manifold equipment.* i. All choke lines shall be straight lines unless turns use tee blocks or are targeted with running tees, and shall be anchored to prevent whip and reduce vibration.

Violation: Minor

Corrective Action: Install the equipment as specified.

Normal Abatement Period: 24 hours.

ii. Choke manifold equipment configuration shall be functionally equivalent to the appropriate example diagram shown in Attachment 1 of this Order.

Violation: Minor

Corrective Action: Install the equipment as specified.

Normal Abatement Period: Prompt correction required.

iii. All valves (except chokes) in the kill line, choke manifold, and choke line shall be a type that does not restrict the flow (full opening) and that allows a straight through flow (same enforcement as item ii).

iv. Pressure gauges in the well control system shall be a type designed for drilling fluid service (same enforcement as above).

c. *Minimum standards and enforcement provisions for pressure accumulator system.* i. 2M system—accumulator shall have sufficient capacity to close all BOP's and retain 200 psi above precharge. Nitrogen bottles that meet manufacturer's specifications may be used as the backup to the required independent power source.

Violation: Minor

Corrective Action: Install the equipment as specified.

Normal Abatement Period: 24 hours.

ii. 3M system—accumulator shall have sufficient capacity to open the hydraulically-controlled choke line valve (if so equipped), close all rams plus the annual preventer, and retain a minimum of 200 psi above precharge on the closing manifold without the use of the closing unit pumps. This is a minimum requirement. The fluid reservoir capacity shall be double the accumulator capacity and fluid level maintained at manufacturer's recommendations. The 3M system shall have 2 independent power sources to close the preventers. Nitrogen bottles (3 minimum) may be 1 of the independent power sources and, if so, shall maintain a charge equal to the manufacturer's specifications.

Violation: Minor.

Corrective Action: install the equipment as specified.

Normal Abatement Period: 24 hours.

iii. 5M and higher system—accumulator shall have sufficient capacity to open the hydraulically-controlled gate valve (if so equipped) and close all rams plus the annular preventer (for 3 ram systems add a 50 percent safety factor to compensate for any fluid loss in the control system or preventers) and retain a minimum pressure of 200 psi above precharge on the closing manifold without use of the closing unit pumps. The reservoir capacity shall be double the accumulator capacity, and the fluid level shall be maintained at manufacturer's recommendations. Two independent sources of power shall be available for powering the closing unit pumps. Sufficient nitrogen bottles are suitable as a backup power source only, and shall be recharged when the pressure falls below manufacturer's specifications.

Violation: Minor.

Corrective Action: Install the equipment as specified.

Normal Abatement Period: 24 hours.

d. *Minimum standards and enforcement provisions for accumulator precharge pressure test.* This test shall be conducted prior to connecting the closing unit to the BOP stack and at least once every 6 months. The accumulator pressure shall be corrected if the measured precharge pressure is found to be above or below the maximum or minimum limit specified below (only nitrogen gas may be used to precharge):

Accumulator working pressure rating	Minimum acceptable operating pressure	Desired precharge pressure	Maximum acceptable precharge pressure	Minimum acceptable precharge pressure
1,500 psi	1,500 psi	750 psi	800 psi	700 psi
2,000 psi	2,000 psi	1,000 psi	1,100 psi	900 psi
3,000 psi	3,000 psi	1,000 psi	1,100 psi	900 psi

Violation: Minor.

Corrective Action: Perform test.

Normal Abatement Period: 24 hours.

e. *Minimum standards and enforcement provisions for power availability.* Power for the closing unit pumps shall be available to the unit at all times so that the pumps shall automatically start when the closing unit manifold pressure has decreased to a pre-set level.

Violation: Major.

Corrective Action: Install the equipment as specified.

Normal Abatement Period: Prompt correction required.

f. *Minimum standards and enforcement provisions for accumulator pump capacity.* Each BOP closing unit shall be equipped with sufficient number and sizes of pumps so that, with the accumulator system isolated from service, the pumps shall be capable of opening the hydraulically-operated gate valve (if so equipped), plus closing the annular preventer on the smallest size drill pipe to be used within 2 minutes, and obtain a minimum of 200 psi above specified accumulator precharge pressure.

Violation: Minor.

Corrective Action: Install the equipment as specified.

Normal Abatement Period: 24 hours.

g. *Minimum standards and enforcement provisions for locking devices.* A manual locking device (i.e., hand wheels) or automatic locking devices shall be installed on all systems of 2M or greater. A valve shall be installed in the closing line as close as possible to the annular preventer to act as a locking device. This valve shall be maintained in the open position and shall be closed only when the power source for the accumulator system is inoperative.

Violation: Minor.

Corrective Action: Install the equipment as specified.

Normal Abatement Period: 24 hours.

h. *Minimum standards and enforcement provisions for remote*

controls. Remote controls shall be readily accessible to the driller. Remote controls for all 3M or greater systems shall be capable of closing all preventers. Remote controls for 5M or greater systems shall be capable of both opening and closing all preventers. Master controls shall be at the accumulator and shall be capable of opening and closing all preventers and the choke line valve (if so equipped). No remote control for a 2M system is required.

Violation: Minor.

Corrective Action: Install the equipment as specified.

Normal Abatement Period: 24 hours.

i. *Minimum standards and enforcement provisions for well control equipment testing.* i. Perform all tests described below using clear water or an appropriate clear liquid for subfreezing temperatures with a viscosity similar to water.

ii. Ram type preventers and associated equipment shall be tested to approved (see item I.D.1. of this order) stack working pressure if isolated by test plug or to 70 percent of internal yield pressure of casing if BOP stack is not isolated from casing. Pressure shall be maintained for at least 10 minutes or until requirements of test are met, whichever is longer. If a test plug is utilized, no bleed-off of pressure is acceptable. For a test not utilizing a test plug, if a decline in pressure of more than 10 percent in 30 minutes occurs, the test shall be considered to have failed. Valve on casing head below test plug shall be open during test of BOP stack.

iii. Annular type preventers shall be tested to 50 percent of rated working pressure. Pressure shall be maintained at least 10 minutes or until provisions of test are met, whichever is longer.

iv. As a minimum, the above test shall be performed:

A. when initially installed;

B. whenever any seal subject to test pressure is broken;

C. following related repairs; and

D. at 30-day intervals.

v. Valves shall be tested from working pressure side during BOPE tests with all down stream valves open.

vi. When testing the kill line valve(s), the check valve shall be held open or the ball removed.

vii. Annular preventers shall be functionally operated at least weekly.

viii. Pipe and blind rams shall be activated each trip, however, this function need not be performed more than once a day.

xi. A BOPE pit level drill shall be conducted weekly for each drilling crew.

x. Pressure tests shall apply to all related well control equipment.

xi. All of the above described tests and/or drills shall be recorded in the drilling log.

Violation: Minor.

Corrective action: Perform the necessary test or provide documentation.

Normal Abatement Period: 24 hours or next trip, as most appropriate.

B Casing and Cementing Requirements

The proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. Any isolating medium other than cement shall receive approval prior to use. The casing setting depth shall be calculated to position the casing seat opposite a competent formation which will contain the maximum pressure to which it will be exposed during normal drilling operations. Determination of casing setting depth shall be based on all relevant factors, including: presence/absence of hydrocarbons; fracture gradients; usable water zones; formation pressures; lost circulation zones; other minerals; or other unusual characteristics. All indications of usable water shall be reported.

—Minimum design factors for tensions, collapse, and burst that are incorporated into the casing design by an operator/leasee shall be submitted to the authorized operator for his review and approval along with the APD for all exploratory wells or as otherwise specified by the authorized officer.

—Casing design shall assume formation pressure gradients of 0.44 to 0.50 psi per foot for exploratory wells (lacking better data).

—Casing design shall assume fracture gradients from 0.70 to 1.00 psi per foot for exploratory wells (lacking better data).

—Casing collars shall have a minimum clearance of 0.422 inches on all sides in the hole/casing annulus, with recognition that variances can be granted for justified exceptions.

—All waiting on cement times shall be adequate to achieve a minimum of 500 psi compressive strength at the casing shoe prior to drilling out.

1. Minimum Standards and Enforcement Provisions for Casing and Cementing.

a. All casing, except the conductor casing, shall be new or reconditioned and tested used casing that meets or exceeds API standards for new casing.

Violation: Major

Corrective Action: Perform remedial action as specified by the authorized officer.

Normal Abatement Period: Prompt correction required.

b. For liners, a minimum of 100 feet of overlap between a string of casing and the next larger casing is required. The interval of overlap shall be sealed and tested. The liner shall be tested by a fluid entry or pressure test to determine whether a seal between the liner top and the next larger string has been achieved. The test pressure shall be the maximum anticipated pressure to which the seal will be exposed. No test shall be required for liners that do not incorporate or need a seal mechanism.

Violation: Minor.

Corrective Action: Perform remedial action as specified by the authorized officer.

Normal Abatement Period: Upon determination of corrective action.

c. The surface casing shall be cemented back to surface either during the primary cement job or by remedial cementing.

Violation: Major.

Corrective Action: Perform remedial cementing.

Normal Abatement Period: Prompt correction required.

d. All of the above described tests shall be recorded in the drilling log.

Violation: Minor.

Corrective Action: Perform the necessary test or provide documentation.

Normal Abatement Period: 24 hours.

e. All indications of usable water shall be reported to the authorized officer prior to running the next string of casing or before plugging orders are requested, whichever occurs first.

Violation: Major.

Corrective Action: Report information as required.

Normal Abatement Period: Prompt correction required.

f. Surface casing shall have centralizers on every fourth joint of casing starting with the shoe joint and up to the bottom of the cellar.

Violations: Major.

Corrective Action: Logging/testing may be required to determine the quality of the job. Recementing may then be specified.

Normal Abatement Period: Prompt correction upon determination of corrective action.

g. Top plugs shall be used to reduce contamination of cement by displacement fluid. A bottom plug or other acceptable technique, such as a suitable preflush fluid, inner string cement method, etc., shall be utilized to

help isolate the cement from contamination by the mud fluid being displaced ahead of the cement slurry.

Violation: Major

Correction Action: Logging may be required to determine the quality of the cement job. Recementing or further recementing may then be specified.

Normal Abatement Period: Based upon determination of corrective action.

h. All casing strings below the conductor shall be pressure tested to 0.22 psi per foot of casing string length or 1500 psi, whichever is greater, but not to exceed 70 percent of the minimum internal yield. If pressure declines more than 10 percent in 30 minutes, corrective action shall be taken.

Violation: Minor.

Corrective Action: Perform the test and/or remedial action as specified by the authorized officer.

Normal Abatement Period: 24 hours.

i. On all exploratory wells, and on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.

Violation: Minor.

Corrective Action: Perform the specified test.

Normal Abatement Period: 24 hours.

C. Mud Program Requirements

The characteristics, use, and testing of drilling mud and the implementation of related drilling procedures shall be designed to prevent the loss of well control. Sufficient quantities of mud materials shall be maintained or readily accessible for the purpose of assuring well control.

Minimum Standards and Enforcement Provisions for Mud Program and Equipment

1. Record slow pump speed on daily drilling report after mudding up.

Violation: Minor.

Corrective Action: Record required information.

Normal Abatement Period: 24 hours.

2. Visual mud monitoring equipment shall be in place to detect volume changes indicating loss or gain of circulating fluid volume.

Violation: Minor.

Corrective Action: Install necessary equipment.

Normal Abatement Period: 24 hours.

3. When abnormal pressures are anticipated. Electronic/mechanical mud monitoring equipment shall be required, which shall include as a minimum; pit volume totalizer (PVT); stroke counter; and flow sensor.

Violation: Minor.

Corrective Action: Install necessary instrumentation.

Normal Abatement Period: 24 hours.

4. A mud test shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.

Violation: Minor.

Corrective Action: Perform necessary tests.

Normal Abatement Period: 24 hours.

5. A trip tank shall be used on 10M and 15M systems and on upgraded 5M systems as determined by the authorized officer.

Violation: Minor.

Corrective Action: Install necessary equipment.

Normal Abatement Period: 24 hours.

6. a. Gas detecting equipment shall be installed in the mud return system for exploratory wells or wells where abnormal pressure is anticipated, and hydrocarbon gas shall be monitored for pore pressure changes.

b. Hydrogen sulfide safety and monitoring equipment shall be available and in use where atmospheric concentrations of hydrogen sulfide of 20 ppm or greater are anticipated.

Violation: Minor.

Corrective Action: Install necessary equipment.

Normal Abatement Period: 24 hours.

7. All flare systems shall be designed to gather and burn all gas. The flare line(s) discharge shall be located not less than 100 feet from the well head, having straight lines unless turns are targeted with running tees, and shall be positioned downwind of the prevailing wind direction and shall be anchored. The flare system shall have an effective method for ignition. Where noncombustible gas is likely or expected to be vented, the system shall be provided supplemental fuel for ignition and to maintain a continuous flare.

Violation: Major.

Corrective Action: Install equipment as specified.

Normal Abatement Period: 24 hours.

8. A mud-gas separator (gas buster) shall be installed and operable for all systems of 10M or greater and for any system where abnormal pressure is anticipated beginning at a point at least 500 feet above any anticipated hydrocarbon zone of interest.

Violation: Minor.

Corrective Action: Install required equipment.

Normal Abatement Period: Prompt correction required.

D. Drill Stem Testing Requirements

Initial opening of drill stem test tools shall be restricted to daylight hours unless specific approval to start during other hours is obtained from the authorized officer. However, DSTs may be allowed to continue at night if the test was initiated during daylight hours and the rate of flow is stabilized and if adequate lighting is available (i.e., lighting which is adequate for visibility and vapor-proof for safe operations). Packers can be released, but tripping shall not begin before daylight, unless prior approval is obtained from the authorized officer. Closed chamber DSTs may be accomplished day or night.

Minimum Standards for Drill Stem Testing

1. A DST that flows to the surface with evidence of hydrocarbons shall be either reversed out of the testing string under controlled surface conditions, or displaced into the formation prior to pulling the test tool. This would involve providing some means for reverse circulation.

Violation: Major.

Corrective Action: Contingent on circumstances and as specified by the authorized officer.

Normal Abatement Period: Prompt correction required.

2. Separation equipment required for the anticipated recovery shall be properly installed before a test starts.

Violation: Major.

Corrective Action: Install required equipment.

Normal Abatement Period: Prompt correction required.

3. All engines within 100 feet of the wellbore that are required to "run" during the test shall have spark arresters or water cooled exhausts.

Violation: Major.

Corrective Action: Install required equipment.

Normal Abatement Period: Prompt correction required.

E. Special Drilling Operations

1. In addition to the equipment already specified elsewhere in this onshore order, the following equipment shall be in place and operational during air/gas drilling:

—Properly lubricated and maintained rotating head *

—Spark arresters on engines or water cooled exhaust *

—Blooie line discharge 100 feet from well bore and securely anchored

—Straight run on blooie line unless otherwise approved

—Deduster equipment *

—All cuttings and circulating medium shall be directed into a reserve or blooie pit *

—Float valve above bit *

—Automatic igniter or continuous pilot light on the blooie line *

—Compressors located in the opposite direction from the blooie line a minimum of 100 feet from the well bore

—Mud circulating equipment, water, and mud materials (does not have to be premixed) sufficient to maintain the capacity of the hole and circulating tanks or pits

Violation: Minor (unless marked by an asterisk).

Corrective Action: Install the equipment as specified.

Normal Abatement Period: 24 hours.

* Violation: Major.

Corrective Action: Install the equipment as specified.

Normal Abatement Period: Prompt correction required.

2. Hydrogen sulphide operation is specifically addressed under Onshore Oil and Gas Order No. 6.

F. Surface Use

Onshore Oil and Gas Order No. 1 specifically addresses surface use. That Order provides for safe operations, adequate protection of surface resources and uses, and other environmental components. The operator/lessee is responsible for, and liable for, all building, construction, and operating activities and subcontracting activities conducted in association with the APD. Requirements and special stipulations for surface use are contained in or attached to the approved APD. Minimum Standards and Enforcement Provisions for Surface Use.

The requirements and stipulations of approval shall be strictly adhered to by the operator/lessee and any contractors.

Violation: If a violation is identified by the authorized officer he shall determine whether it is major or minor, considering the definitions in 43 CFR 3160.0–5, and shall specify the appropriate corrective action and abatement period.

G. Drilling Abandonment Requirements

The following standards apply to the abandonment of newly drilled dry or non-productive wells in accordance with 43 CFR 3162.3–4 and section V of Onshore Oil and Gas Order No. 1. Approval shall be obtained prior to the commencement of abandonment. All formations bearing usable-quality water, oil, gas, or geothermal resources, and/or a prospectively valuable deposit of minerals shall be protected. Approval may be given orally by the authorized officer before abandonment operations are initiated. This oral request and approval shall be followed by a written notice of intent to abandon filed not later than the fifth business day following oral approval. Failure to obtain approval prior to commencement of abandonment operations shall result in immediate assessment of under 43 CFR 3163.1(b)(3). The hole shall be in static condition at the time any plugs are placed (this does not pertain to plugging lost circulation zones). Within 30 days of completion of abandonment, a subsequent report of abandonment shall be filed. Plugging design for an abandonment hole shall include the following:

1. Open Hole.

i. A cement plug shall be placed to extend at least 50 feet below the bottom (except as limited by total depth (TD) or plugged back total depth (PBTD)), to 50 feet above the top of:

a. Any zone encountered during drilling which contains fluid or gas with a potential to migrate;

b. Any prospectively valuable deposit of minerals.

ii. All cement plugs, except the surface plug, shall have sufficient slurry volume to fill 100 feet of hole, plus an additional 10 percent of slurry for each 1,000 feet of depth.

iii. No plug, except the surface plug, shall be less than 25 sacks without receiving specific approval from the authorized officer.

iv. Extremely thick sections of a single formation may be secured by placing 100-foot plugs across the top and bottom of the formation, and in accordance with item ii hereof.

v. In the absence of productive zones or prospectively valuable deposits of minerals which otherwise require placement of cement plugs, long sections of open hole shall be plugged at least every 3,000 feet. Such plugs shall be placed across in-gauge sections of the hole, unless otherwise approved by the authorized officer.

2. Cased Hole. A cement plug shall be placed opposite all open perforations and extend to a minimum of 50 feet below (except as limited by TD or PBTD) to 50 feet above the perforated interval. All cement plugs, except the surface plug, shall have sufficient slurry volume to fill 100 feet of hole, plus an additional 10 percent of slurry for each 1,000 feet of depth. In lieu of the cement plug, a bridge plug is acceptable, provided:

i. The bridge plug is set within 50 feet to 100 feet above the open perforations;

ii. The perforations are isolated from any open hole below; and

iii. The bridge plug is capped with 50 feet of cement. If a bailer is used to cap this plug, 35 feet of cement shall be sufficient.

3. Casing Removed from Hole. If any casing is cut and recovered, a cement plug shall be placed to extend at least 50 feet above and below the stub. The exposed hole resulting from the casing removal shall be secured as required in items 1i and 1ii hereof.

4. An additional cement plug placed to extend a minimum of 50 feet above and below the shoe of the surface casing (or intermediate string, as appropriate).

5. Annular Space. No annular space that extends to the surface shall be left open to the drilled hole below. If this condition exists, a minimum of the top 50 feet of annulus shall be plugged with cement.

6. Isolating Medium. Any cement plug which is the only isolating medium for a fresh water interval or a zone containing a prospectively valuable deposit of minerals shall be tested by tagging with the drill string. Any plugs placed where the fluid level will not remain static also shall be tested by either tagging the plug with the working pipe string, or pressuring to a minimum pump (surface) pressure of 1,000 psi, with no more than a 10 percent drop during a 15-minute period (cased hole only). If the integrity of any other plug is questionable, or if the authorized officer has specific concerns for which he/she orders a plug to be tested, it shall be tested in the same manner.

7. Silica Sand or Silica Flour. Silica sand or silica flour shall be added to cement exposed to bottom hole static temperatures above 230 °F to prevent heat degradation of the cement.

8. Surface Plug. A cement plug of at least 50 feet shall be placed across all annuluses. The top of this plug shall be placed as near the eventual casing cut-off point as possible.

9. Mud. Each of the intervals between plugs shall be filled with mud of sufficient density to exert hydrostatic pressure exceeding the greatest formation pressure encountered while drilling such interval. In the absense of other information at the time plugging is approved, a minimum mud weight of 9 pounds per gallon shall be specified.

10. Surface Cap. All casing shall be cut-off at the base of the cellar or 3 feet below final restored ground level (whichever is deeper). The well bore shall then be covered with a metal plate at least ¼ inch thick and welded in place, or a 4-inch pipe, 10-feet in length, 4 feet above ground and embedded in cement as specified by the authorized officer. The well location and identity shall be permanently inscribed. A weep

hole shall be left if a metal plate is welded in place.

11. The cellar shall be filled with suitable material as specified by the authorized officer and the surface restored in accordance with the instructions of the authorized officer.

Minimum Standard

All plugging orders shall be strictly adhered to.

Violation: Major.

Corrective Action: Contingent upon circumstances.

Normal Abatement Period: Prompt correction required.

IV. Variances From Minimum Standard

An operator may request the authorized officer to approve a variance from any of the minimum standards prescribed in section III hereof. All such requests shall be submitted in writting to the appropriate authorized officer and provide information as to the circumstances which warrant approval of the variance(s) requested and the proposed alternative methods by which the related minimum standard(s) are to be satisfied. The authorized officer, after considering all relevant factors, if appropriate, may approve the requested variance(s) if it is determined that the proposed alternative(s) meet or exceed the objectives of the applicable minimum standard(s).

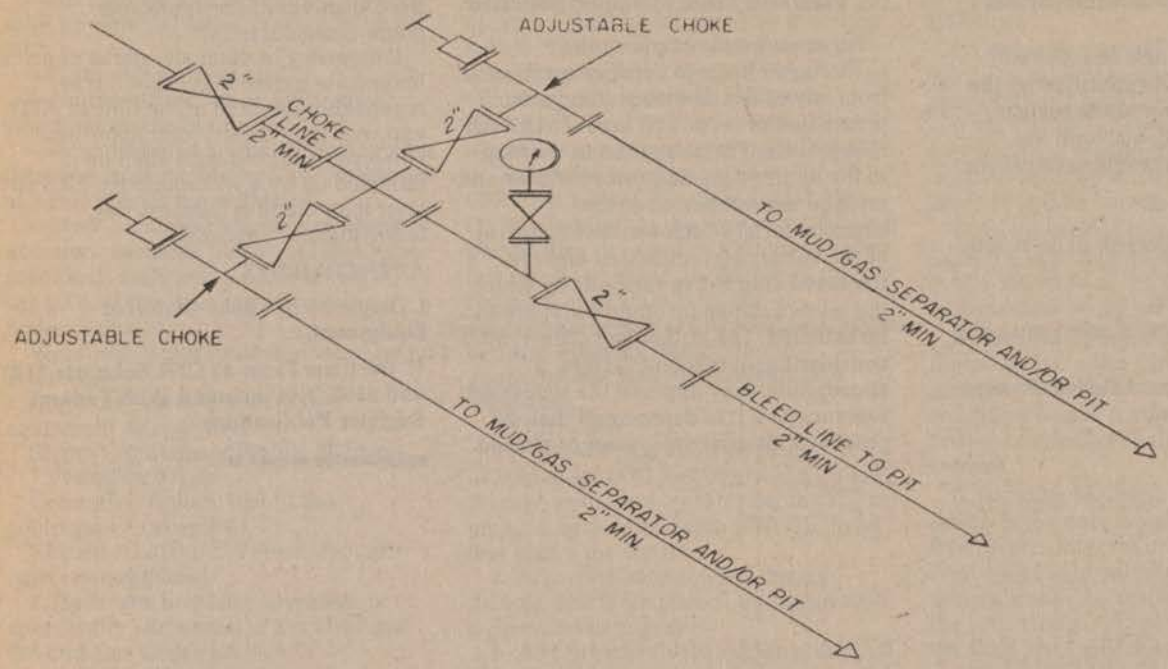
Emergency or other situations of an immediate nature that could not be reasonably foreseen at the time of APD approval may receive oral approval. However, such requests shall be followed up by a written notice filed not later than the fifth business day following oral approval.

ATTACHMENTS

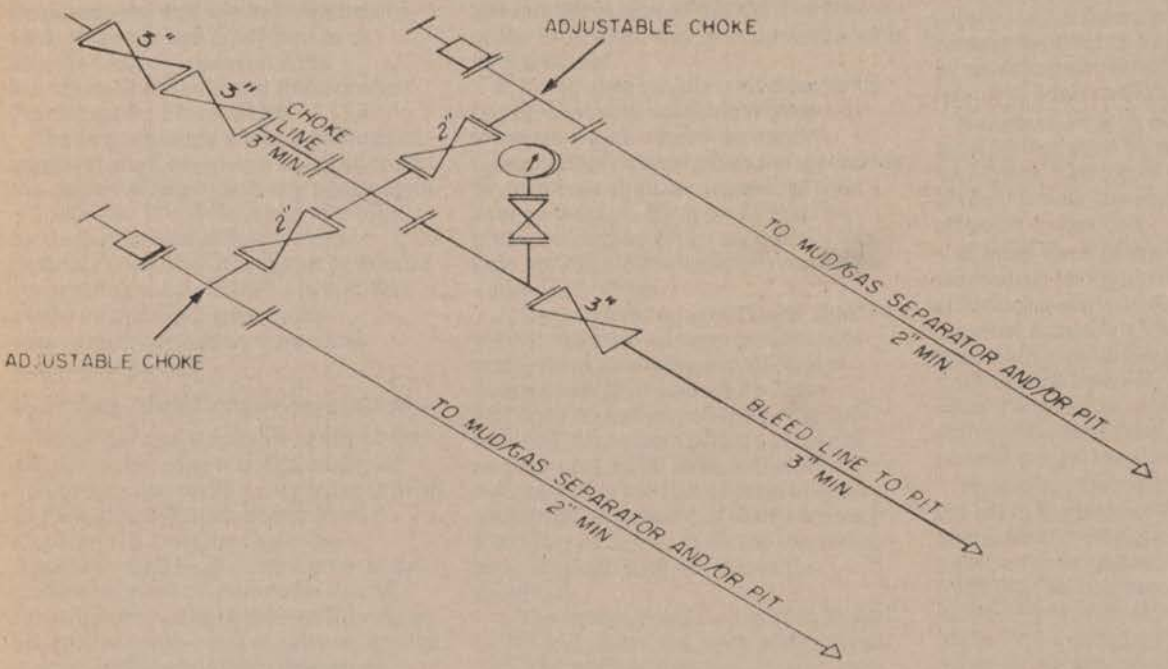
I. Diagrams of Choke Manifold Equipment

II. Sections From 43 CFR Subparts 3163 and 3165 (Not included With Federal Register Publication)

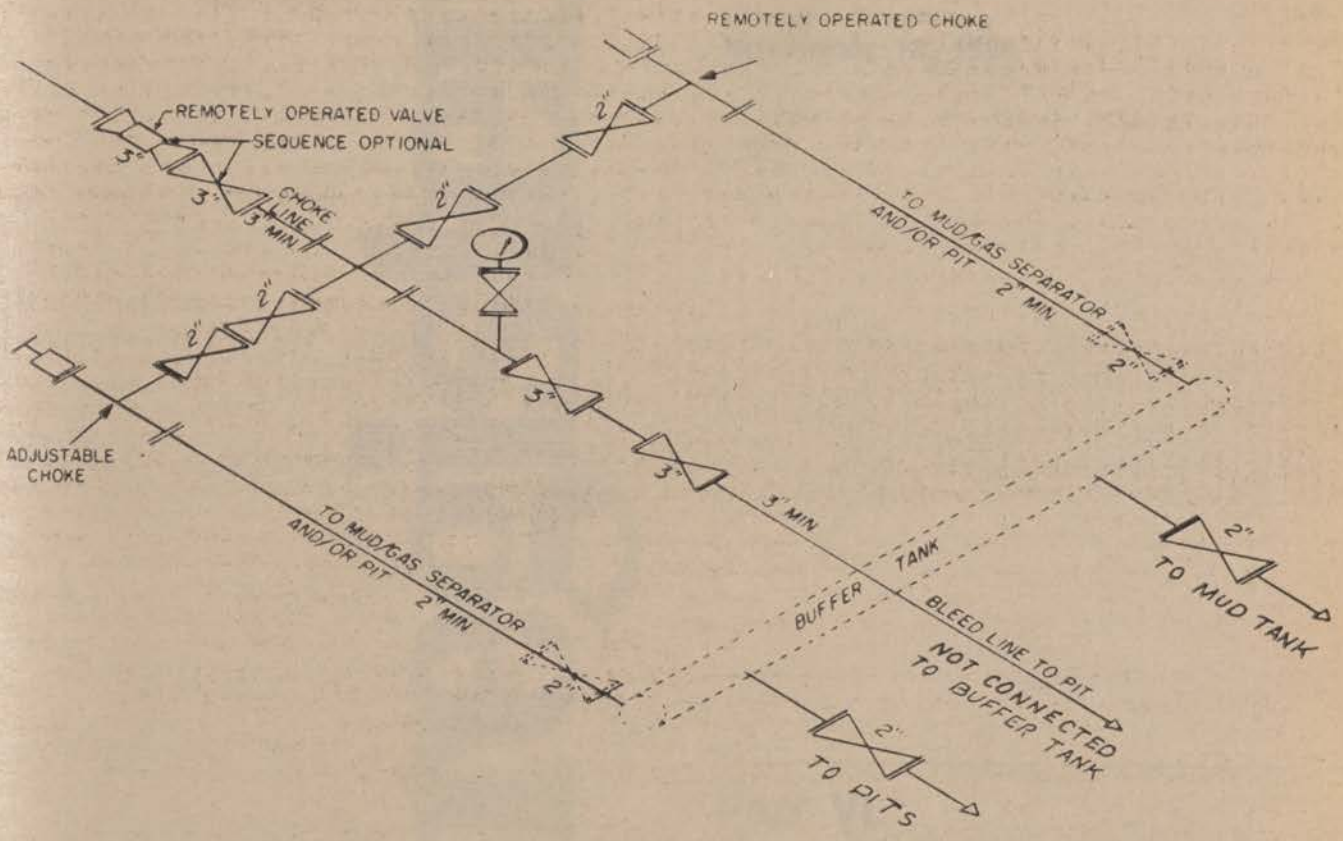
BILLING CODE 4310-84-M



2M CHOKE MANIFOLD EQUIPMENT — CONFIGURATION MAY VARY



3M CHOKE MANIFOLD EQUIPMENT — CONFIGURATION MAY VARY



5M CHOKE MANIFOLD EQUIPMENT — CONFIGURATION MAY VARY

Although not required for any of the choke manifold systems, buffer tanks are sometimes installed downstream of the choke assemblies for the purpose of manifolding the bleed lines together. When buffer tanks are employed, valves shall be installed upstream to isolate a failure or malfunction without interrupting flow control. Though not shown on 2M, 3M, 10M, or 15M drawings, it would also be applicable to those situations.

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