

D82-23A

SUPPLEMENTARY REPORT
Report Pursuant to Section 1014(c) of
Public Law 93-344

This report updates Deferral No. D82-23, transmitted to the Congress on October 1, 1981.

This revision to an Office of Revenue Sharing Deferral in the Department of the Treasury increases the amount previously reported as deferred from \$6,287,398 to \$20,922,173. The increase of \$14,634,775 results from withholding revenue sharing payments to various state governments that have not complied with the requirements of the State and Local Fiscal Assistance Act, as amended.

In addition, this report covers obligations which were withheld from expenditure and then released prior to transmittal of this report. The amount currently deferred for this account is \$4,790,648.

Deferral No: D82-23A

DEFERRAL OF BUDGET AUTHORITY
Report Pursuant to Section 1013 of P.L. 93-344

Agency: Department of the Treasury Bureau: Office of Revenue Sharing	Rev budget authority (P.L. 93-101) S 4,566,700
Appropriation title & symbol State and Local Government Fiscal Assistance Trust Fund 2008111 1/	Other budgetary resources 109,811
	Total budgetary resources 4,676,511
	Amount to be deferred: S. 20,922
	Part of year
	Entire year
OMB identification code: 20-8111-0-7-851	Legal authority (in addition to sec. 1013): <input checked="" type="checkbox"/> Antideficiency Act P.L. 92-512 Sections 121 & 123 <input checked="" type="checkbox"/> Other P.L. 94-483, P.L. 96-604
Grant program <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Type of budget authority: <input checked="" type="checkbox"/> Appropriation <input type="checkbox"/> Contract authority <input type="checkbox"/> Other
Type of account or fund: <input type="checkbox"/> Annual <input type="checkbox"/> Multiple-year (expiration date) <input checked="" type="checkbox"/> Bi-year	

Justification

The State and Local Government Fiscal Assistance Trust Fund is the vehicle for disbursement of general revenue sharing funds. This deferral represents payments withheld from various governments involved in annexations or incorporations and for reasons of noncompliance with the requirements of the State and Local Fiscal Assistance Act, as amended.

Estimated Effect

The release of these funds is contingent upon adherence by the various governments to the compliance regulations, and a determination of eligibility to receive those funds withheld because of annexations and incorporations.

Outlays Effect

There is no outlay effect of this deferral because the funds are expected to be made available this fiscal year.

1/ This account is the subject of another deferral (D82-22) and was the subject of a similar deferral in FY 1981.
2/ Deferral of outlays only.
* Revised from previous report.

Federal Register

**Wednesday
March 24, 1982**

Part V

Department of the Interior

**Office of Surface Mining Reclamation and
Enforcement**

**Permanent Regulatory Program; Use of
Explosives and Training, Examination,
and Certification of Blasters; Proposed
Regulations**

DEPARTMENT OF THE INTERIOR

Office of Surface Mining Reclamation and Enforcement

30 CFR Parts 715, 780, 816, and 817

Surface Coal Mining and Reclamation Operations; Permanent Regulatory Program; Use of Explosives

AGENCY: Office of Surface Mining Reclamation and Enforcement, Interior.
ACTION: Proposed rule.

SUMMARY: The Office of Surface Mining Reclamation and Enforcement (OSM) proposes to amend existing rules in 30 CFR Chapter VII relating to the use of explosives. The proposed rule would revise the requirements relating to blasting schedules, preblasting surveys, airblast monitoring requirements, and ground vibration.

New rules are proposed governing portions of the permanent program rules remanded by the U.S. District Court for the District of Columbia, and for portions of the initial program rules remanded by the Court of Appeals for the District of Columbia Circuit.

DATES:

Written comments: Accepted until 5 p.m. (eastern time) on April 23, 1982.

Public Hearings: Held on request only, on April 16, 1982, at 9:00 a.m. (local).

Public meeting: Scheduled on request only.

ADDRESSES:

Written comments: Hand-deliver to the Office of Surface Mining, U.S. Department of the Interior, Administrative Record (TSR 14.06), Room 5315, 1100 L Street, NW., Washington, D.C.; or mail to the Office of Surface Mining, U.S. Department of the Interior, Administrative Record (TSR 14.06), Room 5315L, 1951 Constitution Avenue, NW., Washington, DC 20240.

Public hearings: Washington, D.C.—Department of the Interior Auditorium, 18th and C Streets, NW.; Pittsburgh, Pa.—William S. Moorehead Federal Building, Room 2212, 1000 Liberty Avenue; and Denver, Colo.—Brooks Tower, 2d Floor Conference Room, 1020 15th Street.

Public meetings: OSM offices in Washington, D.C.; Charleston, W. Va.; Knoxville, Tenn.; Indianapolis, Ind.; Pittsburgh, Pa.; and Denver, Colo.

FOR FURTHER INFORMATION CONTACT:

Public hearings and information: Jerry R. Ennis, Office of Surface Mining, U.S. Department of the Interior, 1951 Constitution Avenue, NW., Washington, DC 20240; (202) 343-7887.

Public meetings: Jose del Rio, 202-343-4022.

SUPPLEMENTARY INFORMATION:

- I. Public Commenting Procedures.
- II. Background.
- III. Discussion of Proposed Rules.
- IV. Procedural Matters.

I. Public Commenting Procedures*Written Comments*

Written comments should be specific, pertain only to the issues proposed in this rulemaking, and include explanations in support of the commenter's recommendations. Commenters are requested to submit five copies of their comments (see "Addresses"). Comments received after the time indicated under "Dates" or at locations other than Washington, D.C., will not necessarily be considered or be included in the Administrative Record for the final rulemaking.

Public Hearings

Persons wishing to comment at the public hearings should contact the person listed under "For Further Information Contact" by the close of business three working days before the date of the hearing. If no one requests to comment at a public hearing at a particular location by that date, the hearing will not be held. If only one person requests to comment, a public meeting, rather than a public hearing, may be held and the results of the meeting included in the Administrative Record.

Filing of a written statement at the time of the hearing is requested and will greatly assist the transcriber. Submission of written statements in advance of the hearing will allow OSM officials to prepare appropriate questions.

Public hearings will continue on the specified date until all persons scheduled to comment have been heard. Persons in the audience who have not been scheduled to comment and wish to do so will be heard following those scheduled. The hearing will end after all persons scheduled to comment, and persons present in the audience who wish to comment, have been heard.

Public Meetings

Persons wishing to meet with OSM representatives to discuss these proposed rules may request a meeting at any of the OSM offices listed in "Addresses" by contacting the person listed under "For Further Information Contact."

All such meetings are open to the public and, if possible, notices of meetings will be posted in advance in

the Administrative Record room (1100 L St.). A written summary of each public meeting will be made a part of the Administrative Record.

II. Background

The Surface Mining Control and Reclamation Act of 1977, 30 U.S.C. 1201 *et seq.* (the Act), sets forth initial regulatory procedures, permit requirements, and environmental performance standards in Sections 502(c), 507(g), and 515(b)(15), respectively, governing the use of explosives in surface coal mining operations. Section 516 provides performance standards governing the surface effects of underground mining. Rules implementing those sections were published by OSM at 42 FR 62639 (December 13, 1977) under the initial regulatory program (30 CFR 715.19) and at 44 FR 14901 (March 13, 1979) under the permanent regulatory program (30 CFR 780.13, 816.61-816.68, and 817.61-817.68).

In litigation over the initial program rules, the U.S. Court of Appeals for the District of Columbia issued a decision on May 2, 1980. *In re: Surface Mining Regulation Litigation*, 627 F. 2d 1346 (D.C. Cir. 1980). That decision addressed two blasting issues: (1) The 1,000-foot limitation on blasting near houses, schools, and other buildings in § 715.19(e)(1)(vii), and (2) the 1.0-inch-per-second limitation on particle velocity produced by blasting in § 715.19(e)(2)(ii). The 1,000-foot limit was found to be an invalid interpretation of § 522(e) (4) and (5) of the Act and the 1.0-inch-per-second vibration limit was ruled as arbitrary and capricious because it lacked technical support.

On May 16, 1980, in litigation over the permanent program rules, the U.S. District Court for the District of Columbia remanded the 1,000-foot limitation on blasting in § 816.65(f). *In re: Permanent Surface Mining Regulation Litigation*, No. 79-1144, (D. D.C. May 16, 1980). The court did not invalidate the 1.0-inch-per-second vibration limit, but at note 19 in its opinion the court recognized that the court of appeals had invalidated a similar provision in § 715.19(e)(2)(ii) in the initial program rules. To implement the court's decision, §§ 816.65(f) and 817.65(f) were suspended by notice at 45 FR 51549 (August 4, 1980).

In response to these decisions, blasting rules were reviewed by OSM and amendments proposed at 46 FR 6982 (January 22, 1981).

On January 28, 1981, the Secretary of the Department of the Interior ordered

that all regulations which were excessive, burdensome, or counterproductive be identified and asked States and industry to recommend sections to be revised. OSM, in compliance with the administrative mandate to simplify and remove excessive regulatory burdens, withdrew the rules proposed at 46 FR 6982 (January 22, 1981) by notice at 46 FR 32455 (June 23, 1981) in order to allow OSM to undertake a more general review of all the blasting rules under the permanent regulatory program.

OSM today is reproposing certain rules governing the use of explosives under the initial and permanent regulatory programs. Rules governing the use of explosives in surface coal mines are found in 30 CFR Chapter VII at §§ 715.19, 780.13, 816.11, 816.61-816.68, 817.11, and 817.61-817.68. These sections are proposed to be amended by reorganizing several sections and by removing any performance standards believed to be more appropriately left to the discretion of the regulatory authority. Existing § 816.65, containing most of the performance standards, would be modified and those standards would be placed in other sections as follows: (1) Restrictions on timing of blasts would be placed under blasting schedules in § 816.64; (2) access control and warnings would be placed under proposed § 816.66; (3) specific limits regarding prevention of adverse impacts of blasting would be placed under revised § 816.67; and (4) § 816.65(f) would be revised and is proposed as § 780.13. Proposed §§ 816.61, 816.62, and 816.68 would remain similar to the existing rule, except as discussed below.

This present rulemaking proposes changes to the initial regulatory program requirements with regard to the use of explosives (§ 715.19), to the permanent regulatory program requirements for permitting with regard to blasting plans (§ 780.13), for performance standards with regard to the use of explosives for surface mining activities (§§ 816.61-816.68), and for performance standards with regard to the use of explosives for underground mining activities (§§ 817.61-817.68).

III. Discussion of Proposed Rules

The rules, as proposed, would place increased responsibility on the operator to protect the public from injury and public and private property from damage due to the potential adverse effects of blasting operations. Explosives manufacturers, users, universities, and governmental agencies have conducted tests and research in predicting the effects of blasting and are learning new and improved methods to

control blasting energy. OSM expects that the regulatory authority will use technical reference publications and research findings, such as those produced by the Bureau of Mines, in the development of design criteria for use in blasting operations.

These proposed rules would place increased responsibility on design professionals, such as certified blasters and blast vibration experts, in establishing the design standards to meet the regulatory performance goals contained herein. Failure to meet performance criteria would necessitate regulatory authority intervention in specifying more stringent standards and a closer inspection or monitoring program. Those operators staying below the approved limits, complying with approved performance standards, and maintaining a responsible relationship with surrounding residents would be able to operate without additional constraint.

In promulgating the prior permanent program rules governing blasting, OSM analyzed the technical references which were available through the fall of 1978. Those materials formed the basis for a peak-particle-velocity standard of 1.0 inch per second and other permanent program performance standard rules for use of explosives and are listed at 44 FR 15179. OSM also relied upon those references in this rulemaking and recommends that interested parties consider those references as well as the following additional and more recent technical documents considered by OSM in the development of these revised rules:

Bollinger, G.A., 1971, Blast vibration analysis: Southern Illinois University Press, Carbondale and Edwardsville, 132 pp.

Hemphill, Gary B., 1981, Blasting operations: McGraw-Hill Book Co., New York City, 258 pp.

Medearis, Kenneth, 1976, The development of rational damage criteria for low-rise structures subjected to blasting vibrations: National Crushed Stone Association, Washington, D.C., 94 pp.

Roth, Julius, Britton, K.C., Campbell, R.W., Ketter, W.R., 1977, Evaluation of surface mining blasting procedures: Prepared by Management Science Associates for U.S. Bureau of Mines under contract J0366017, 152 pp.

Siskind, D.E., Stachura, V.J., Stagg, M.S., and Kopp, J.W., 1980, Structure response and damage produced by airblast from surface mining: U.S. Bureau of Mines Report of Investigations RI8485, 111 pp.

Siskind, D.E., Stagg, M.S., and Stachura, V.J., 1979, Safe ground vibration and airblast criteria: 51st Annual Meeting, Eastern Section Seismological Society of America, October 1979, Blacksburg, Va.

Siskind, D.E., Stagg, M.S., Kopp, J.W., Dowding, C.H., 1980, Structure response and

damage produced by ground vibration from surface mine blasting: U.S. Bureau of Mines Report of Investigations RI8507, 74 pp.

Stacura, V.J., Siskind, D.E., and Engler, A.J., 1981, Airblast instrumentation and measurement techniques for surface mine blasting: U.S. Bureau of Mines Report of Investigations RI8508, 53 pp.

Stagg, M.S., and Engler, A.J., 1980, Measurement of blast-induced ground vibration and seismograph calibration: U.S. Bureau of Mines Report of Investigations RI8506, 62 pp.

Swedish Detonic Research Foundation, 1978, Annual Report 1978: 14 pp.

U.S. Bureau of Mines, 1971, Blasting vibrations and their effects on structures: Bulletin 656, 105 pp.

Responses to Comments on Proposed Rule Revision Published at 46 FR 6982, (January 22, 1981)

Several comments were received admonishing OSM for cancelling the public hearings on blasting rules published January 22, 1981. The proposed rulemaking herein revises those proposed rules, and public hearings will be held as listed in this Federal Register notice. There is no intent by OSM to publish these rules without an opportunity for public comment.

Several comments cited the proposed rules as a "cook-book" approach containing excessive design constraints. OSM accepts these comments and through this proposal hopes to reduce or eliminate reliance on "cook-book" rules.

Currently Proposed Rules for 30 CFR Parts 715, 780, 816 and 817

Section 715.19 Use of explosives (Amendments 1 through 4)

Amendments 1 through 3 present three options for amending § 715.19(e)(2) of the initial program governing ground vibration limits. The contents and discussion of this section are the same as those addressed later in this preamble under § 816.67(d), which is the corresponding section of the permanent program rules, and are therefore not repeated here. Amendment 4 would remove Section 719(e)(3), the requirements of which would be incorporated into Paragraph (e)(2) by Amendments 1, 2, or 3. Paragraph (e)(4) would be redesignated as Paragraph (e)(3).

Section 780.13 Operation plan: Blasting (Amendment 5)

Blasting plans outline procedures the applicant intends to follow in conducting blasting operations. Existing § 780.13 requires each application to have a blasting plan, sets standards for blasting plans, and details the

information to be submitted along with the permit application.

OSM recognizes that if the blast design is not implemented properly, any planned safety precaution cannot be assured. However, the mere existence of a certified blast design, rather than a verbal or "back-of-an-envelope" pattern or sketch, will help assure proper implementation. Also, if the individual certifying the blast design is the responsible blaster, he or she will understand the reasons for the design and direct his or her crew appropriately.

OSM proposed to reduce the amount of information required in the blasting plan. The existing rules require detail beyond that necessary to insure compliance with the Act.

OSM proposed to eliminate from § 780.13 the requirement to estimate the type and approximate amount of explosives to be used for each type of blasting operation. OSM believes that this degree of detail during the permitting process is unnecessary to assure compliance with the performance standards in Parts 816 and 817 of the rules.

Proposed § 780.13(a) requires the operator to demonstrate in the blasting plan that the operator has the capacity and intent to achieve the applicable performance standards. In the blasting plan the operator would review what means he intends to apply to achieve the performance set out in § 816.61-816.68. The plan would include information setting out the applicable limits and justifying the use of these limits. The plan would also discuss steps to be taken to control the adverse effects of blasting operations.

Existing § 780.13(b), with regard to recordkeeping, is proposed for deletion, since the recordkeeping requirements of 30 CFR 816.68 are adequate to assure compliance with its requirements. Should recordkeeping be inadequate, a notice of violation could be issued for noncompliance with the requirements of § 816.68.

Existing § 780.13(c) is proposed for deletion. The requirements for information with regard to blasting warning and site access would be contained in proposed paragraph (a), providing information on meeting standards of §§ 816.61 through 816.68.

Existing § 780.13(d) would be rewritten and renumbered as § 780.13(b). It would provide that each application must contain a description of the blasting monitoring system to be used to ensure compliance with the standards of 30 CFR 816.61-816.68, including the type, capability, and sensitivity of any blast monitoring

equipment, and proposed procedures and locations of monitoring.

Existing § 780.13(e) is proposed for deletion. Under proposed §§ 816.62 and 817.62, each preblast survey must be submitted to the regulatory authority. OSM does not believe that it is necessary to provide further information with regard to surveys within the permit application.

Existing § 780.13(f) is proposed for deletion. Hazardous situations cannot be anticipated in the permit application. Often they are caused by weather or other unforeseeable factors. OSM believes that certified blasters will be aware of such situations and proceed with due caution.

A new § 780.13(c) is proposed which would require additional information when blasting would be conducted within 1,000 feet of any building used as a dwelling, public building, school, or community or institutional building or within 500 feet of an underground mine. Distance limits which prohibited blasting within 1,000 feet or 500 feet in the existing permanent program performance standards under §§ 816.65(f) and 817.65(f) and in the initial program rules under § 715.19(e)(1)(vii) were remanded by court action. *In re: Surface Mining Regulation Litigation*, 627 F.2d 1346 (D.C. Cir. 1980) and *In re: Permanent Surface Mining Regulation Litigation No. 79-1144 (D.D.C. May 16, 1980)*. Proposed § 780.13(c) would not prohibit mining within 1,000 feet of residences and certain other public buildings, nor within 500 feet of underground mines. However, OSM seeks additional information in these sensitive areas.

Therefore, proposed § 780.13(c)(3) requires that the operator submit information outlining specific precautions and criteria to be implemented to protect persons and property when blasting within 1,000 feet of certain buildings and 500 feet of underground mines, including sketches of drill patterns, delay periods, decking, type and amount of explosives to be used, critical dimensions, and location and general description of structures to be protected. Thus, where the damage potential is highest, the regulatory authority will have the greatest information to insure adequate protection.

The 1,000-foot and 500-foot criteria are proposed so that the operator is alerted that special precautions are necessary to prevent property damage and personal injury when conducting blasting operations within these distances. Existing § 816.65(f) includes provisions for pipelines, utilities, and other facilities. Because public or

worker safety is not a problem in these specific areas and these facilities are not generally endangered from airblast or ground vibration, no specific provision would be included.

The blast design required when blasting within the 1,000-foot or 500-foot limits would serve three purposes: (1) Provides a record of the blast design (not required of blasts outside these limits), (2) provides notification to the regulatory authority so that monitoring may be scheduled, and (3) requires a certified blaster to sign the design confirming its preparation by a certified blaster. The requirement that a certified blaster prepare the design would impose on the blaster the responsibility for carrying out the blast as designed. It also would assure that a competent professional has designed the blast. Paragraph (c)(5) would insure that the regulatory authority will have the right to amend designs to improve the land of safety, if necessary.

Proposed § 780.13(c)(6) also would provide for notification to owners of structures close to blast sites 30 days before blasting will occur.

Section 816.11 Signs and markers (Amendment 6)

Existing § 816.11(f) is proposed for removal because the requirements of § 816.11(f) (1) and (3) would be included in proposed §§ 816.66 and 817.66 as described below. Section 816.11(f)(2) is proposed for removal because it is duplicative of Mine Safety and Health Administration (MSHA) rule 30 CFR 77.1303(g).

Section 816.61 Use of explosives: General requirements (Amendment 7)

Existing § 816.61(a) is proposed to be revised so that the first sentence reads "operator" rather than "person who conducts surface mining activities." This revision simplifies the language and applies throughout the blasting rules.

Existing § 816.61(b) would be retained in the proposed rule. This paragraph requires a schedule for blasts that use more than 5 pounds of explosives. The requirements of the schedule are set out in § 816.64, discussed below.

Existing § 816.61(c) would be retained in the proposed rule and provides that a blaster certified under a program adopted pursuant to Subchapter M must be responsible for all blasting operations, including the transportation, storage, use, or destruction of explosives. Thus, only qualified professionals would prepare blast designs.

*Section 816.62 Use of explosives:
Preblasting survey (Amendment 8)*

Section 816.62(a) of the existing rules requires the owner or resident of a manmade structure within one-half mile of the permit area to request a preblasting survey only from the regulatory authority. The regulatory authority then requests the person who conducts surface coal mine operations to conduct the survey. OSM believes that in most cases it would be more effective to have the resident or owner contact the operator directly. Accordingly, the proposed rules would allow the resident or owner to either submit their request to the operator or to the regulatory authority. An operator would be required to conduct the survey promptly and to promptly prepare the report. Updated surveys could be requested by the owner or resident at anytime. The requirement in existing § 816.62(a) that copies of the written report of the survey be provided to the regulatory authority and to the person requesting the survey would be moved to proposed § 816.62(c).

One commenter on the January 22, 1981, proposed rule suggested that no blasting in new permit areas should occur until all requested preblasting surveys within one-half mile of the permit area are completed to the satisfaction of the regulatory authority. The commenter cited examples of citizens who had asked for preblasting surveys and did not receive them, but the blasting continued. Because surveys may be requested at any time, it is OSM's view that it is inappropriate to require that they be completed prior to permit issuance, or even the initiation of blasting. The requirement that they be completed promptly is intended to insure that those requests received prior to permitting be completed prior to blasting and that, in any case, surveys be conducted as quickly as practicable after the date of the request.

Another commenter on the January 22, 1981, proposed rules questioned limiting the preblasting survey to structures within one-half mile of the permit area since ground vibrations from blasting may extend beyond the one-half mile limit. Under Section 515(b)(15) of the Act preblasting surveys are only required to be offered within one-half mile of the permit area. OSM believes that the proposed standards, if applied properly, will protect all structures affected by blast vibration including those beyond one-half mile.

The same commenter stated that the cost of the structural inspection should always be borne by the operators. The Act requires that the applicant or

permittee shall conduct the survey. No basis is provided for requiring the costs to be borne by the property owners. OSM agrees with this comment and believes that the costs of preblasting surveys should be required to be provided by the operator.

Two comments stressed the need to publish guidelines as a basis for content of preblasting surveys. The commenters were displeased with the inconsistency among preblasting surveys. OSM acknowledges these comments and hopes to provide additional guidance at some future time on methods of conducting preblasting surveys and typical procedures, formats, and specific items that should generally be given special attention.

Existing § 816.62(b) sets the requirements for the contents of the preblasting survey. Among other information the preblasting survey must give special attention to "the preblasting condition of wells and other water systems used for human, animal, or agricultural purposes and to the quantity and quality of the water." Several States have questioned the application of existing § 816.62(b) and whether water quality and quantity samples were required for each water system under the preblasting survey.

Proposed § 816.62(b) sets out requirements similar to the existing section except that the detail required with regard to water quality would be reduced. Under the proposed rules, preblast surveys would address the condition of the structure and document any preblast damage or structural defects. Assessments of structures such as pipelines, cables, transmission lines, and wells, cisterns, and other water systems would be required, but such assessments need not include extensive analysis. Extensive analysis need not be required on every survey. Rather, the person conducting the survey should give attention to such water systems and should document all available data and determine whether such additional analysis is appropriate, based upon the significance of the water system, its vulnerability, and the availability of data.

Some commenters on the January 22, 1981, proposed rules suggested that preblast surveys should not include merely superficial visual observation, but should also include a detailed study of the capabilities of the structure to experience and resist stress and strain. In addition, it was suggested that the regulatory authority needs more definitive structural information to allow for a determination of whether the blasting plan would prevent damage

given various structural parameters. One group offered the comment that, if the January 22, 1981, approach were adopted, every home within one-half mile of the permit area would qualify for a new blasting survey because the present surveys did not include sufficient information about structural condition to determine the maximum safe particle-velocity or scale-distance factor. OSM believes that the survey should provide a basic description of preblasting damage and any physical factors anticipated to be particularly sensitive to blasting. Analysis of structural capabilities may be carried out as part of the preblasting survey, but it is not specifically required.

Normal settlement and aging of a structure may create stresses which cause threshold damage during the lifetime of a structure. Ground-water level variations, seasonal temperature changes, strong winds, noise, and slamming doors create dynamic forces in a structure which can cause cracks or other damage. Some experts believe that many natural stresses, such as settlement stresses, may be misattributed to blasting.

Experts agree that blast vibration may enhance normal settlement, but as Siskind and others (1980; RI8507) indicate, repetition and fatigue effects are not well known and require further study. OSM acknowledges the difficulty in differentiating between normal stress damage and blast-introduced damage.

With the preblasting survey available, a homeowner can, at a minimum, determine when damage occurred. Damage can, therefore, be attributed to either before or after blasting. If damage does occur after a blast, the owner should notify the regulatory authority immediately. At this time, records can be evaluated, and action between the operator and owner initiated to repair any damage determined to have been caused by blasting.

Existing § 816.62(c) requires that the preblasting survey be signed by the person who conducts the survey. It provides that the survey may contain recommendations for blasting procedures or special conditions to the blasting plan. When completed, copies of the survey are to be sent to the regulatory authority and the person requesting the survey. A mechanism for resolving disagreements with the results of the survey is provided.

Proposed § 816.62(e) would require the person completing the survey to sign it and to provide the original of the report to the regulatory authority and a copy to the person requesting it. It also allows the person who requested the survey to

disagree with its contents by submitting a written, detailed description of the disagreement.

In a preproposed draft circulated to interested parties, OSM had proposed to delete the mechanism for resolving disagreements with the preblasting survey. OSM received comments which opposed this deletion. OSM agrees with this comment and herein proposes to retain the last sentence of paragraph (c) of the existing rule with regard to mechanisms resolving disputes.

OSM proposes to delete the discussion in § 816.62(c) with regard to recommendations. OSM believes that this provision is unnecessary. This rule is intended to address the minimum requirements; additional information may, of course, be included. The survey may include recommendations, or other information the person preparing the survey believes appropriate.

Section 816.64 Use of explosives: Public notice of blasting schedule (Amendment 9)

The title of this existing § 816.64 would be shortened to "Use of explosives: Blasting schedules" in proposed § 816.64.

Existing § 816.64(a)(1) requires each person who conducts surface coal mining activities to publish a blasting schedule 10-20 days before blasting. These requirements would be moved to proposed § 816.64(b)(1) and are discussed below.

Existing § 816.65(a) restricts the hours of blasting to daylight hours except if a safety hazard would result. When such a hazard would result, oral notices would be provided to local residents, and a complete written report would be filed with the regulatory authority. It further allows the regulatory authority to restrict blasting to more limited time periods based on public requests or other relevant information to prevent adverse noise.

Such restrictions are not necessarily applicable in all areas. In isolated areas, for example, there may be no reason to limit blasting to daylight hours. And in other areas it may be more appropriate to limit blasting to only a few hours per day.

Proposed § 816.64(a)(1) would allow blasting only at times approved by the regulatory authority and announced in the blasting schedule. No daylight restriction would be automatically applicable. The proposed rule would allow the regulatory authority to restrict scheduled blasts to specific times. The regulatory authority's decision restricting blasts must be justified on the basis of public health and safety,

including the prevention of excessive noise.

In some instances, such as unusual weather conditions or unavoidable delays, public or operator safety may dictate unscheduled detonations. Obviously, where public or operator safety so requires, unscheduled blasting is appropriate. The proposed rule at § 816.64(b)(2) would allow such unscheduled blasts.

The proposed rule would also allow unscheduled blasts in nonemergency situations. Certain blasting activities incidental to surface coal mining, such as blasting for road construction or faceup areas and unanticipated delays due to weather or equipment failure, would be allowed on a nonperiodic basis. These blasts are difficult to schedule in advance and are more appropriately conducted on an unscheduled basis. Existing regulations with regard to unscheduled blasts are contained in § 816.64(c), which OSM proposes to remove. Proposed § 816.64(a)(2) would establish the requirements for unscheduled blasts to the verbal notification of affected residents and to the documentation of conditions, reasons for the unscheduled blast, and names of persons notified as required by § 816.68(p). All blasts must meet the environmental performance standards of § 816.67, discussed below.

The proposed paragraph (b)(1) would require publication of the blasting schedule from 10 to 30 days before blasting is to begin. The existing rule in § 816.64(a) requires publication to occur no more than 20 days before blasting. This longer time frame would allow operators more flexibility and could provide for more effective and earlier notification to local residents of the availability of preblasting surveys.

Proposed paragraphs (b)(2) and (b)(3) contain information on initial schedule distribution, republishing, and availability of preblasting surveys found at existing § 816.64(a)(2) and (3). The distribution and republication requirements of the proposed rule would be essentially the same as those of the existing rule, in which the blasting schedule must be distributed to local governments, public utilities, and each residence within one-half mile of the permit area (excluding haul or access roads, preparation and loading facilities, and transportation facilities between coal excavation areas and preparation or loading facilities where blasting is not conducted). Under both the existing and the proposed rule, when the blasting schedule is distributed to residences, it must be accompanied by information explaining how to request a preblasting survey.

Proposed paragraph (b)(3) would require republication of the schedule every 12 months, whenever the area covered by the schedule changes, 10-30 days before the new schedule takes effect, or when actual blasting times will differ from those previously announced.

Existing § 816.64(b), relating to the contents of the blasting schedule, would be amended and renumbered as proposed § 816.64(c). One commenter on the preproposed draft circulated to interested parties suggested that a requirement for name, address, and telephone number of operator be added. This would allow individuals to contact the operator directly with questions about the blasting schedule and inform the operator of any blasting concerns. OSM has incorporated this provision in proposed § 816.64(c)(1).

Existing § 816.64(b)(1) requires specificity in the blasting schedule, and requires a description "as accurately as possible" of the location and time of the blast. This paragraph would be deleted from the blasting schedule contents of the proposed rule.

Proposed § 816.64(c)(2) and (3) would require the identification of specific areas where blasting will occur and the dates and times when blasting will occur. An operator would be required to provide sufficient specificity that the recipients of the blasting schedule will be able to determine when and where blasts will run, and be aware of potential hazards. Residents would not, in most cases, be advised of the exact time and point where every charge will be detonated.

The provisions of existing paragraph (b)(2)(i) limiting the area covered in the blasting schedule to 300 acres would be deleted. OSM believes that in fulfilling Section 515(b)(15) of the Act the blasting schedule limitations should be defined by the regulatory authority. The regulatory authority may choose to limit blasting to a specific area if appropriate, based upon the site-specific conditions and typical blasting operations within that State.

The 4-hour time limit in existing § 816.64(b)(2)(ii) is not necessarily related to the prevention of damage from blasting, but rather related to local public convenience. As set out in proposed § 816.64(a)(1), time limits on blasting operations would be specified by the regulatory authority if appropriate for the locale. In many cases, limitations on blasting times are contained in existing State blasting laws.

Proposed § 816.64(c)(4) and (5) would require the blasting schedule to contain exploration of the methods to be used to

control access to blasting areas and the meaning of audible warning and all-clear signals to be used. These requirements are currently contained in § 816.64 (b)(2)(iii) and (iv).

Section 81665 (Deletion) (Amendment 10)

Existing § 816.65 would be removed, and its requirements would be incorporated in other sections as discussed below.

The requirements contained in existing § 816.65(a) and (b) are proposed in amended form at § 816.64. Proposed § 816.64 is discussed above.

The requirements contained in existing § 816.65(c) are proposed as § 816.66(b). The periodic notification of meanings of warning and all-clear signals which is currently required would be deleted. OSM believes that these notifications would be adequately provided through blasting signs and the blasting schedule.

Existing § 816.65(d) with regard to access to the permit area would be rewritten and renumbered as § 816.66(c), discussed below.

Existing § 816.65(e), governing airblast, would be proposed as new § 816.67(b). See discussion below of § 816.67.

Existing § 816.65(f) sets specific requirements applicable to blasting within 1,000 feet of inhabited areas. Blasting within 1,000 feet of inhabited areas would be in the safety zone discussed in conjunction with § 780.13 above.

Existing § 816.65(g) with regard to flyrock would be governed by proposed § 816.67(c). Changes are discussed below.

Existing § 816.65(h) with regard to the safe conduct of blasting operations is proposed as the lead-in language of § 816.67(a), discussed below.

Existing § 816.65(i) with regard to ground vibration is proposed as part of § 816.67(d).

Existing § 816.65(j), identifying the circumstances where less stringent performance standards may apply, would be incorporated into proposed § 816.67(e).

Existing § 816.65(k) and (l), presenting scale-distance formulas, would be contained in proposed as § 816.67(d), discussed below.

Proposed new § 816.66 Use of explosives: Signs, warnings, and access control (Amendment 11)

Proposed new § 816.66 would contain provisions for blasting signs and warning procedures throughout the permit area. These requirements currently are found in existing

§§ 816.11(f)(1) and (3), and 816.65(c) and (d), but OSM believes it is more advantageous if listed as part of the blasting rules for continuity. Proposed § 816.66 also contains the physical access and control requirements to fulfill the notification provisions of Section 515(b)(15)(A) and the public protection provisions of 515(b)(15)(C) of the Act.

Proposed § 816.16(a) would require conspicuous signs reading "Blasting Area" where the right of way of any public road comes within 100 feet of a blasting area, or any other road provides access to the area. Existing § 816.11(f)(1) contains the same requirements, but requires the signs only when a road comes within 50 feet of a blasting area within the permit area. OSM believes that the proposed provision is equally protective. Notice along any road that provides access to a blasting area will ensure that anyone entering the blasting area is aware that blasting is taking place.

Signs reading "Warning! Explosives in Use" and which clearly explain the blast warning and all-clear signals and the markings of blast areas and charge holes would also be required at all entrances to the permit area from public roads and highways.

All signs used to mark blasting areas would also be required to conform to the sign requirements set out in § 816.11.

Proposed § 816.66(b) includes provisions contained in existing § 816.65 (c). This paragraph would require the use of audible warning and all-clear signals. The revised provision would delete the requirement to periodically deliver notice of meanings of warning and all-clear signals, as both signs and the blasting schedule must contain this notice and both are constantly available. But it would still require notification of the meaning of the signals to those who work in the permit area. The requirement to maintain signs would be removed here but would be covered under § 816.66(a).

Section 816.66(c) is proposed to include the contents of existing § 816.65(d). OSM would delete the first sentence because it is redundant when read with the more specific requirements of the rest of the section. The paragraph would require the restriction of access to the area until hazards no longer exist and access can be safely resumed. Both livestock and persons would be protected.

§ 816.67 Use of explosives: Seismographic measurements (Amendment 12)

The title of § 816.67 would be changed to "Use of explosives: Control of adverse effects" in proposed § 816.67.

Existing § 816.67 sets standards governing seismographic measurements and ground vibration. It allows the substitution, with the approval of the regulatory authority, of a scaled-distance equation (in existing § 816.65(1)) for seismographic measurements where peak-particle-velocities less than 1.0 inch per second are to be assured. The regulatory authority is allowed to require seismographic measurements of these blasts. Seismographic requirements would be incorporated into proposed § 816.67(d), and are discussed below.

Proposed § 816.67 would set limits for airblast, ground vibration, and flyrock and would provide other requirements to prevent damage as a result of blasting. Authority for this section is found in Sections 515(b)(15)(C) and 516 of the Act.

Section 515(b)(15)(C) states that the rules must contain provisions to "limit the type of explosives and detonating equipment, the size, the timing and frequency of blasts based upon the physical conditions of the site so as to prevent (i) injury to persons, (ii) damage to public and private property outside the permit area, (iii) adverse impacts on any underground mine, and (iv) change in the course, channel, or availability of ground or surface water outside the permit area". [Emphasis added.]

Many comments were received regarding damage criteria found in the proposed rules at 46 FR 6982, January 22, 1981. Most were concerned with what level of damage was to be prevented. Some commenters felt that the mandate of the Act was to prevent all damage, while others believed that a prevention of all major and minor damage and avoidance of threshold damage were acceptable.

The Bureau of Mines (Siskind and others, 1980, RI8507) lists three categories of damage: Threshold damage, minor damage, and major damage. Major damage means structural failure and occurs at levels of ground vibration generally beyond those occurring in surface mining blasts. Threshold and minor damage, however, may occur due to ground vibration normally experienced in coal mining operations. Minor damage includes falling plaster and cracks in concrete masonry and in brick and mortar joints. Threshold damage has been described

as lengthening of existing cracks at intersecting construction elements. Since the Acts does not distinguish between threshold and minor damage, and requires *prevention* of damage, the level of damage subject to these rules is considered to be *any* damage which is not documented in the preblasting survey and which diminishes the value of the structure either to the owner or a prospective buyer.

Proposed § 816.67 would combine existing §§ 816.65(e), (g), (h), (k), and (1), as well as existing § 816.67 as discussed below.

Proposed § 816.67(a) would include the requirements of existing § 816.65(h). This would require that blasting be conducted safely to prevent injury to persons, damage to property, adverse impacts on underground mines, or changes to the course channel, or availability of water.

Proposed § 816.67(b) would amend existing § 816.65(e) with regard to airblast. Under existing practice, when the operator prepares the blast plan required by § 780.13, he identifies one of four maximum airblast levels (depending on the type of measuring system and the expected frequency of the airblast). The proposed rule at § 816.67(b) would operate in a similar manner but has been adjusted to reflect actual problems OSM has encountered with the standards in the existing rule. Because the C-weighted slow-response measuring technique is less accurate and because operators seldom use this type of measuring system, OSM proposes to eliminate this standard. The standard for instruments with accuracy below 0.1 Hz (hertz) is proposed for deletion since the sensitivity of this type instrument is beyond normal field use and generally requires laboratory conditions.

Accordingly, the airblast limitations in proposed § 816.67(b)(1) would set maximum airblast limits for frequencies below 2 Hz and for frequencies below 6 Hz, but the C-weighted slow-response and the 0.1 Hz standards would be eliminated. Under the proposed rule, at the time of permitting, the operator would propose, and the regulatory authority would accept, one of these two standards or another, lower standard if site conditions require. The limit should be consistent with technical reference publications such as Report RI8485 by the Bureau of Mines (Siskind and others, 1980).

Because weather conditions may focus or amplify airblast, paragraph (b)(1)(iii) would require the operator to meet the standards even under adverse atmospheric conditions.

Some commenters felt that airblast limits should be deleted and reference publications used. OSM believes that the limits specified would provide the protection required by the Act and proposed to reissue maximum airblast levels for compliance with protection of property.

A commenter questioned whether a notice of violation should be issued if airblast exceeded the allowable limit if measured at a structure which was not the nearest to the blast site. Monitoring "near or at the nearest structure" may be improper in a program to evaluate airblast compliance. Technical publications indicate that wind direction, atmospheric conditions, and local topography can focus airblast away from some areas near the blast to other locations. Therefore, the proposed rule would require that airblast standards be met at every location. Allowable airblast limits cited on page 66 of the Bureau of Mines Report RI8485 (Siskind and others, 1980) would be included in § 816.67(b) as allowable performance standards.

Proposed § 816.67(b)(2) would set requirements for monitoring. The operator would be required to monitor airblast when and where required by the regulatory authority. The existing rule at § 816.65(e)(2) requires monitoring equipment to have an upper-end flat frequency response of at least 200 Hz. Some copies of the Code of Federal Regulations incorrectly indicate that the current standard is 1,100 Hz. (See 44 FR 15404.) OSM proposes to retain the requirement that monitoring equipment have an upper-end flat frequency response of at least 200 Hz.

Existing § 816.65(g) defines flyrock as material traveling along the ground. One commenter was concerned that the definition did not include all material that should be considered as flyrock. OSM has also encountered difficulties with this definition because occasionally flyrock is cast fairly high into the air. The definition in proposed § 816.67(c) would include material cast into the air or along the ground.

Changes are also proposed to the description of the area where flyrock may be cast. Both the existing and proposed rules prohibit the casting of flyrock more than one-half the distance to the nearest dwelling or other occupied structure, and beyond the area of regulated access. However, where existing § 816.65(g) prohibits flyrock beyond areas owned or leased by the permittee, proposed § 816.67(c) would prohibit flyrock from being cast off the permit area. This change is proposed to ensure that unregulated areas are not

subject to flyrock, which will ensure safer operation.

§ 816.67(d) Ground vibration (Amendments 13, 14, or 15)

Provisions governing ground vibration are proposed to be incorporated in the initial program performance standards at 30 CFR 715.19(e)(2), the permanent program surface mining performance standards at 30 CFR 817.67(d). Three options are proposed for all three performance standards. The standard promulgated will be the same for each. Accordingly the discussion here, although keyed to § 816.67(d), will also apply to §§ 817.67(d) and 715.19(e)(2). (See Amendments 1, 2, or 3 and 24, 25, or 26.)

Several factors contribute to the damage potential associated with the ground vibration resulting from a blast. Most important are the type and condition of structures within the area subject to ground vibration. Obviously older structures are more susceptible to blast damage than newer structures; those engineered to withstand heavy loads are more safe still. OSM has identified five structure types having different threshold levels of damage. Sensitive structures such as historic buildings, monuments, and residences with rough stone foundations or plaster interiors have been documented as having low thresholds for damage associated with blasting. These structures should be protected from blast vibration with a peak-particle-velocity in excess of 0.5 inch per second. Older homes (those more than 20 years old or those constructed with plaster-on-lath interiors or those with deteriorated or rigid, brittle, or easily fractured construction materials) can withstand somewhat greater blast associated peak-particle-velocities than those designated as historic or sensitive. These, however are more subject to damage from low frequency blasts than from those with higher frequencies.

Modern homes with gypsum board interiors, reinforced concrete or concrete masonry unit foundation, and wood-frame and wood-clad structures can withstand greater blast vibrations. These structures can generally withstand a vibration of 1.0 inch per second and higher values as frequencies increase.

Certain structures are designed to withstand even greater forces. These include water towers, impoundments, tunnels, pipelines, towers, and underground mines. These structures can generally withstand a vibration of 2.0 inches per second.

The fifth type of structure can withstand even heavier loads. Those designed to be earthquake, wind, or traffic resistant may be able to withstand even greater vibrations. For these, a professional engineer should be consulted to determine the limit for ground vibration.

For a more complete discussion of structure type and the ability to withstand blast vibration, see Bureau of Mines Report of Investigations RI8507 (Siskind and others, 1980).

The intensity of the ground vibration is another element contributing to damage. Intensity is determined by the peak-component velocity of the particles in the wave of ground vibration generated by the blast. This peak-particle-velocity is the subject of regulation in this portion of the rule.

Peak-particle-velocity is measured by seismographs. While some seismographs provide resultant readings which summarize the peak-particle-velocity in all directions, OSM proposes to adopt the Bureau of Mines recommendation to record vibration in three mutually perpendicular directions. Generally, one of the three components will be of greater magnitude. Because the damage potential of a blast is linked to the greatest vibration in any direction, the component readings are a more accurate predictor of damage potential. Accordingly, it is this measure which should be applied to limit ground vibration and prevent damage.

The frequency of ground vibration is another factor in determining the damage done by a blast. Generally, blasts associated with surface mining are in the low-frequency ranges. Low-frequency blasts are generally associated with the highest incidences of damage; again structure type is an important factor. For discussions of the relationships between blast damage and frequency, see Bureau of Mines Bulletin 656 (1971) and RI8507 (Siskind and others, 1980).

Generally, high frequency blasts (over 40 Hz) only cause damage when associated with peak-particle-velocities in excess of 2 inches per second. Blasts between 10 and 40 Hz can cause damage in historic or older structures at peak-particle-velocities above 0.5 and 1.0 inch per second, respectively, and in modern structures up to 1.5 inches per second. Low frequency blasts (below 10 Hz) may require limits as low as 0.5 inch per second for historic structures, 0.75 inch per second for older structures, and 1.0 inch per second for modern structures.

Blast vibration frequency resulting from any given blast depends on a variety of factors, especially site-specific geology. For a discussion of factors governing ground vibration frequency, see medearis (1976).

Charge-weight is the weight, in pounds, of explosives used in the blast. Because the amount of explosives used determines the intensity of the blast, it is this measure which must be limited to insure safe blasting. The weight of explosives is the weight of the actual explosive material. Each type of explosive has properties producing different explosive characteristics. Thus an operator may use ammonium nitrate based or nitroglycerine based explosives but, if the weights are the same, the blast intensities would be considered equivalent.

The velocity of the sound wave (ground vibration) is determined by the substance through which it travels. Velocity is higher through more dense materials and lower through less dense materials. This variable tends to affect the frequency makeup of the ground vibration wave and becomes directly related to the potential for damage. Low frequency waves and low density materials have a greater potential for damage.

The most common and least expensive method of controlling blast vibration is the application of an

equation to determine the amount of explosives which can safely be detonated within a specific delay period. The Bureau of Mines has determined that blasts occurring at intervals equal to or exceeding 8 milliseconds do not contribute to the cumulative intensity of the ground vibration. Therefore, no more than the amount of explosives calculated by the equation must be detonated per 8-millisecond period. An acceptable equation for limiting vibration is $W=D^2/(Ds)$, where W =the charge-weight of explosives to be detonated in any 8-millisecond delay period and D =the distance from the point of the blast to the nearest structure to be protected. Ds is a constant developed to relate to specific particle-velocity predictors. Ds is referred to as the square-root scaled-distance factor and is equal to D/\sqrt{W} .

Both the Bureau of Mines and the Swedish Detonic Research Foundation have conducted research on recorded blast vibration intensities, their probabilities, and occurrences, which correlate well to produce equations predicting ground vibration from scaled-distance values.

The equation derived by the Bureau of Mines for the mean equation of points relating peak-particle-velocity (PPV) to scaled-distance is $PPV=133 (Ds)^{-1.5}$ and by the Swedish Foundation is $PPV=102 (Ds)^{-1.45}$. Due to the differing points recorded the mean equation of points is slightly different. In developing an equation for general use, the mean equation must be analyzed to consider the probability of occurrence which produces the maximum limit. Siskind and others (1980, RI8507) developed statistical probability of upper limits by taking two standard deviations about the mean regression curve. The curve representing a 95-percent confidence level is the equation $PPV=408(Ds)^{-1.5}$. (See Figure A.)

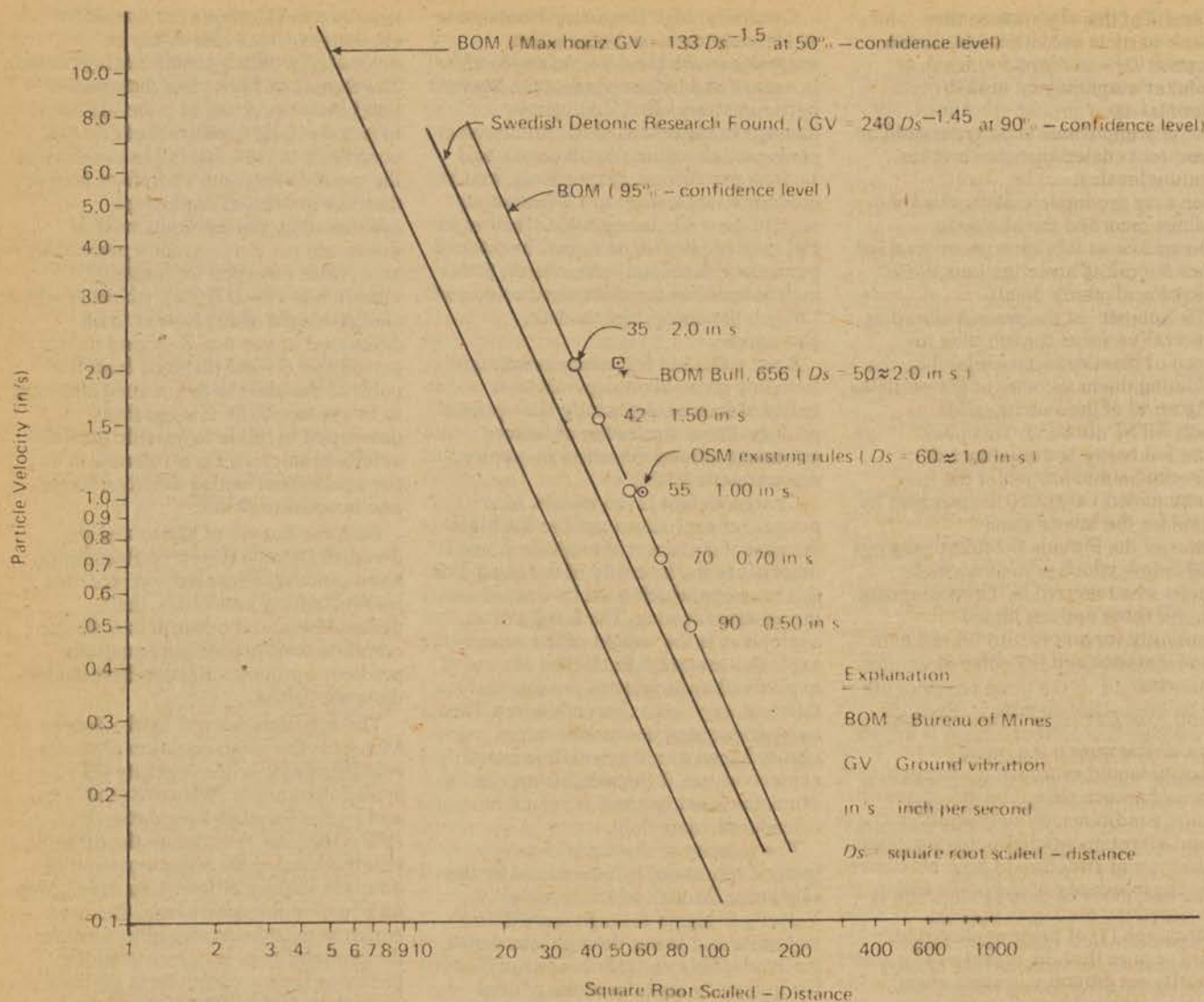


Figure A. - Correlation of square root scaled - distance with particle velocity.
(Source: Modified from Figure 10 in Bureau of Mines Report R18507.)

Results of this equation render values of peak-particle-velocity of 1.0 inch per second at $Ds=55$ and 0.50 inch per second at a square-root scaled-distance factor $Ds=90$.

To fully implement a program using square-root scaled-distance criteria, vibration levels must be identified which may produce damage. The Bureau of Mines recorded threshold damage at levels as low as 0.72 inch per second for a plaster-on-lath structure and in evaluating all study points recommends a 0.75-inch-per-second standard as a conservative value to eliminate the chance of blast damage. OSM, in evaluating the most recent damage data in Figure 46 of the Bureau of Mines Report RI8507, finds only 5 of 32 damage points fell below the existing 1.0-inch-per-second standard, while the recommended value of 0.75 inch per second for the lowest particle velocity chosen by the Bureau of Mines is the value below which no evidence of damage was reported in the most recent data. All three options include the opportunity for an operator to use a scaled distance and not seismic monitoring.

Option 1 for § 816.67(d) (Amendment 13)

Under this option the regulatory authority would establish a particle velocity for each permit based on site-specific conditions. The allowable ground vibration would be limited either by the type of structure to be protected or by the frequency of the blast. (See also Amendments 1 and 24.)

Paragraph (1) of the proposed rule would require that the regulatory authority set ground vibration peak-particle-velocity for each permit area based on actual site condition. The applicant would be required to submit information with regard to structure type and probable frequencies along with the permit application such that the limit could be properly established. Where an operator would proceed pursuant to Paragraph (5) (that is, substitute a scaled-distance equation) no additional information would be required in the application.

Paragraph (2) would apply that standard to the operator. The limit would not be permitted to be exceeded at any structure.

In Paragraph (3) OSM proposes maximum limits for peak-particle-velocity. Because these standards are maximum limits, the regulatory authority may find it appropriate to set

lower limits. The levels presented are considered to prevent damage when applying the following rationale:

Particle-velocity values selected in this option reflect the record of threshold damage. Frequencies below 5 Hz were recorded at less than 2 percent of the coal mine blasts. These are discussed briefly above and more completely in the Bureau of Mines Report RI8507. Very few shots produce frequencies below 10 Hz. If the probability of threshold damage at 1.0 inch per second is about 18 percent and minor damage at about zero percent, it is believed that 1.0 inch per second as an upper limit provides reasonable protection when monitoring of all shots is required. (See Figure 39 in RI8507.) Historically, OSM has found that under the initial program practice of using a 1.0-inch-per-second standard, few blasts actually reached or exceeded that limit. Therefore, the probability of damage would be substantially less than if the limit were continuously met. Additionally, in order to achieve a 1.0-inch-per-second performance level, operators will generally design for a much lower limit, such as 0.75 or 0.5 inch per second. The design level compensates for typical scatter of recorded velocities using various scaled-distance values.

Paragraph (4) presents a scaled-distance equation which would be permissible with regulatory authority approval without seismic monitoring. The equation would allow the operator to figure a charge-weight which can be used to insure that the allowable peak-particle-velocity is less than would otherwise be permissible. This equation would insure a greater level of safety than that required when seismic monitoring is provided, because seismic monitoring insures that operators and the regulatory authority are aware of what levels of vibration are actually being achieved. The correlation of particle velocity with the scaled distance is designed to give a 95-percent confidence level.

Paragraph (5) would provide an equation for determining allowable blast vibration without detailed site information. This equation assumes a safe particle velocity of 0.75 inch per second and applies the scaled distance equation with a distance factor of 70. Use of this limit would not be the most cost effective for the operator, because the generally lower limits may require

smaller blasts which may be less effective.

Paragraph (6) would provide a mechanism requiring a regulatory authority to evaluate blast data whenever necessary to prevent damage resulting from blasting. The reevaluation may lead to reduction of the allowable standard if found to be too lenient to assure the prevention of damage.

Option 2 for § 816.67(d) (Amendment 14)

Under proposed Option 2, OSM would establish maximum allowable ground vibration limits dependent on the distance to the nearest structure. Because the standards set out in the rule would not prevent damage to the most sensitive structure, the regulatory authority would set more stringent requirements where sensitive structures are found. As discussed above, the operator could substitute a scaled-distance equation for use without seismic monitoring. (See also Amendments 2 and 25.)

This alternative approach to the square-root scaled-distance equation would adopt the equation presented by Medearis in the 1976 report to the National Crushed Stone Association. This equation was suggested by a commenter. It would allow higher charge-weights where higher blast vibration frequencies exist and more conservative charge-weights (thus less vibration intensity) as blast vibration frequency decreases with distance. This concept has been incorporated by several States, although not for coal operations, but it is believed to provide results similar to those suggested by the Bureau of Mines Report RI8507, to reduce particle-velocity when low frequency blast vibrations occur. The equation is derived from the particle-velocity propagation equation $V=M(D\sqrt{W})^{-N}$, where V =Peak-particle-velocity, D =distance to monitoring point, W =charges weight per delay interval, and M and N =empirical constants not related to frequency.

The equation $W=D^{1.5}/90$ uses a 90 derived for the empirical value for the constants referred to in the particle-velocity equation. The use of this equation provides a stepped particle-velocity approach easily applied by an operator. Figure B provides a graphic representation of the sliding particle velocity correlation to scaled-distance values.

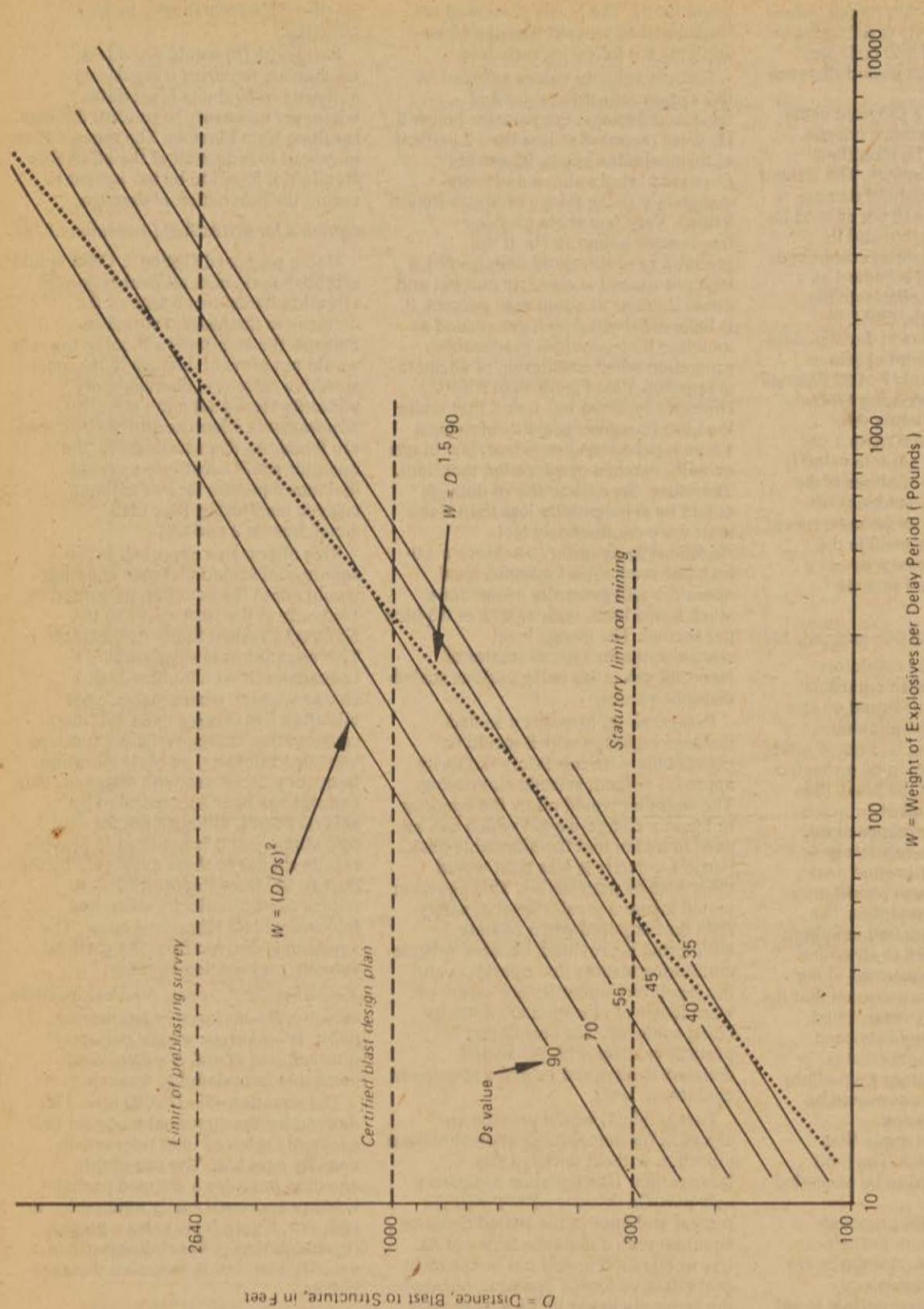


Figure B.—Correlation of square root scaled distance $W = (D/D_s)^2$ at varying D_s values with proposed equation $W = D^{1.5}/90$.

As offered in the proposed rule, the equation $W=D^{1.5}/90$ correlates with a square root scaled-distance of $Ds=55$ at 1,100 feet. This would provide a peak-particle-velocity standard of approximately 1.0 inch per second at 1,000 feet comparable to the result intended in the 1.0-inch-per-second standard issued March 13, 1979. This similarity also correlates with the requirement proposed in § 780.13(c) requiring a blast design within 1,000 feet of inhabited residences. This facet of the proposed rules would provide for potentially larger charges and particle-velocities within 1,000 feet, than with the 1-inch-per-second rule, but would require blaster awareness and demonstrated knowledge of the design criteria when blasting within this zone.

Paragraph (3) of this option would require the regulatory authority to evaluate new blasting data if requested in writing by the owner or resident of a structure in the vicinity of the blast site to determine if a lower peak-particle-velocity standard or lower scaled-distance equation is necessary to protect the site. Factors which would require a lower standard are blast vibration frequency, geologic conditions, structure type and condition, or damage associated with blasting.

As with Option 1, paragraph (4) of Option 2 would allow the regulatory authority to require a seismographic record of any blast.

Option 3 for § 816.67(d) (Amendment 15)

Option 3 presents a simpler approach to limitations on peak-particle-velocity. In the option OSM would set a flat limit that is not to be exceeded at any structure outside the permit area. (See also Amendments 3 and 26.)

A maximum peak-particle-velocity of 1.0 inch per second would be set for general use. This would insure the prevention of damage in approximately 90 percent of all structures. The standard would not be applied if the operator demonstrates and the regulatory authority finds that the ground vibration conforms to the limits set out in Appendix B of the Bureau of Mines Report RI8507. Use of this appendix would allow higher peak-particle-velocity when frequency is higher. Generally 2 inches per second is acceptable with frequencies above 40 Hz.

As with Options 1 and 2 a scaled-distance equation would be allowed which would dictate charge-weights based on the distance to the nearest structure when seismic monitoring is not used. In order for seismic monitoring to be waived, the predicted peak-particle-

velocity cannot exceed 1 inch per second.

Paragraph (3) would require the regulatory authority to review, after request from an owner or resident of any structure in the vicinity of the blast site, the available data and would allow the regulatory authority to set more stringent limitations if appropriate, based on new data. Data which would be considered include blast frequency, site information, structure type, or reports of any damage.

Paragraph (4) would allow the regulatory authority to require seismic monitoring and to specify where such monitoring should occur.

Section 816.68 Use of explosives: Records of blasting operations (Amendment 16)

The lead paragraph to existing § 816.68 requiring the operator to maintain blasting records and to make them available for inspection by the regulatory authority and the public on request as required in Section 515(b)(15)(B) of the Act would be editorially amended. No change in effect is intended. No changes are proposed in Paragraphs (a)-(c), (f), (h), (i), and (k). These paragraphs cover the name of the operator; the location, date, and time of the blast; the name, signature, and license number of the blaster in charge; the type of material blasted; the diameter and depth of holes, the type of explosives used, and the maximum weight of explosives detonated within any 8-millisecond period. Revisions to particular items to be included in the records also would be made as follows:

Paragraph (d) would be revised by adding the identification of the nearest structure but not those structures owned or leased by the operator. Such information is necessary for blast design and planning process.

Paragraph (e) would be shortened to read "weather conditions" without specific data to be recorded. This does not lessen the need for temperature, wind direction, and approximate velocity data, but allows each regulatory authority to specify the extent of weather data to be recorded.

Paragraph (g) providing for the number of holes, decks, burden, and spacing would be removed. The new proposed paragraph (g) would require sketches of the blast pattern. The number of holes, decks, burden, spacing and delay pattern must be included in a sketch for it to be useful and acceptable.

Paragraph (j) would be changed to reflect the total weight of explosives per holes, rather than total weight used, because Section 515(b)(15)(B) of the Act specifically cites a per-hole record.

Existing paragraph (l) requires records of the numbers of holes detonated within 8 milliseconds. This provision would be deleted because the information can be established by review of the sketch of the delay pattern required in proposed paragraph (g).

Existing paragraph (m), with regard to initiation systems, would be redesignated as paragraph (l).

Existing paragraph (n), with regard to type and length of stemming, would be redesignated as paragraph (m).

Existing paragraph (o), with regard to mats or other protections used, would be redesignated as paragraph (n).

Existing paragraph (p) would be removed because information with regard to detonators and delay periods would be included in the description of initiation devices required by proposed paragraph (l) and sketches required by proposed paragraph (g).

Existing paragraph (q) would be removed because a sketch of the delay pattern is required by proposed paragraph (g).

Existing paragraph (r), which requires a record of the number of persons in the blasting crew, would be deleted. It is believed that any provision limited crew size can be observed and carried out without recording the number of persons.

Existing paragraph (s) dealing with seismographic records would be modified. Proposed paragraph (o) already would include the same provisions as the existing paragraph (s) plus additional information. A requirement for date and time of reading also would be added. OSM believes that this necessary information is already included on most records and instruments available.

Proposed paragraph (o) would also include addition of airblast records. Airblast records may or may not be part of the seismographic record. Therefore, the term airblast has been added to avoid any doubt that airblast records were included in the records requested by the regulatory authority. This information is necessary for the seismographic record to be of use in analyzing the blast.

Proposed paragraph (p) would be added to insure that regulatory authorities have sufficient information to review use of unscheduled blasts and that they may respond to complaints.

Rules governing use of explosives associated with underground mining (Amendments 17-27)

The performance standards governing the use of explosives associated with underground mining are identical to

those governing the use of explosives associated with surface mining except as noted below. Most offsite impacts, for example, airblast and ground vibration, for surface blasting at underground mines are not substantially different from those for blasting at surface mines, and OSM only regulates surface blasting.

Only one difference exists between the two sets of rules. Rather than require a blasting schedule in § 817.64 similar to the found in § 816.64 of the proposed surface coal mining rules, § 817.64 would require a 24-hour notice prior to any surface blasting in support of underground coal mining. Because of the occasional, sporadic nature of surface blasting in support of underground coal mining, the public would be better served by receiving notification the day before any blasting is done. The mine operator also would be relieved of the task of publishing and republishing a blasting schedule.

Surface mines, however, use more regular, more periodic, and more predictable blasting. Accordingly, the regulation proposes in § 817.64(a) that notice be provided prior to each surface blast where underground mining will occur while proposed § 816.64 would require that schedules be provided where surface mining will occur. This is the only significant difference between the two sets of rules. The requirement that residents or owners be advised how to obtain preblasting surveys would be contained in § 817.62(c), since there would be no § 817.64(b)(2).

Amendment 28—Addition of Figure 1

Figure 1, which is referred to in three places in the proposed rules, is from the Bureau of Mines Report RI8507 (p. 73). It would be added to the text of § 715.19(e)(2)(ii)(A), 816.67(d)(1), and 817.67(d)(1).

IV. Procedural Matters

Executive Order 12291

The Department of the Interior (DOI) has examined these proposed rules according to the criteria of Executive Order 12291 (February 17, 1981). OSM has determined that these are not major rules and do not require a regulatory impact analysis because they will impose only minor costs on the coal industry and coal consumers. In addition, the proposed rules emphasize the use of performance standards instead of design criteria and will allow operators to utilize the most cost-effective means of achieving the performance standards.

Regulatory Flexibility Act

The DOI has also determined, pursuant to the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, that these rules will not have a significant economic impact on a substantial number of small entities. The proposed rules will allow small coal operators increased flexibility in meeting performance standards and should especially ease the regulatory burden on small coal operators in Appalachia.

National Environmental Policy Act

OSM has prepared a draft environmental assessment (EA) on this proposed rule and has made an interim finding that it would not significantly affect the quality of the human environment. The draft EA is on file in the OSM Administrative Record at the address listed in the "Addresses" section of this preamble. A final EA will be completed and a final conclusion reached on the significance of any resulting impacts before issuance of the final rule. OSM also is preparing an EA of the cumulative impacts on the human environment of this rulemaking and related rulemakings under the Act. This cumulative EA also will be completed before this rule is made final.

Federal Paperwork Reduction Act

The information collection requirements in existing 30 CFR Parts 715, 780, 816, and 817 were approved by the Office of Management and Budget (OMB) under 44 U.S.C. 3507 and assigned new clearance numbers 1029-0007, 1029-0036, 1029-0047, and 1029-0048 on April 1, 1981. This approval was identified in "Notes" at the introduction to 30 CFR Parts 715, 780, 816, and 817 under the old numbers RO494, RO606, RO618, and RO619 (all under No. B-190462). OSM will delete those "Notes" and codify the OMB approvals under the new §§ 715.10, 780.10, 816.10, and 817.10. OSM is requesting OMB approval of the information collection requirements being proposed for the following sections and will codify the OMB approvals when the final rules are promulgated: §§ 715.19, 780.13, 816.62, 816.64, 816.68, 817.62, and 817.68.

The information required by 30 CFR Part 715 will be used by the regulatory authority in monitoring blasting operations. This information required by 30 CFR Part 715 is mandatory.

The information required by 30 CFR Part 780 will be used by the regulatory authority in determining whether the applicant can meet the environmental protection performance standards of the regulatory program. This information

required by 30 CFR Part 780 is mandatory.

The information required by 30 CFR Parts 816 and 817 will be used by the regulatory authority in monitoring and inspecting surface and underground mining activities to ensure that they are conducted in a manner which preserves and enhances environmental and other values of the Act. This information required by 30 CFR Parts 816 and 817 is mandatory.

Accordingly, 30 CFR Parts 715, 780, 816, and 817 are proposed to be amended as set forth herein.

Dated: March 9, 1982.

Daniel N. Miller, Jr.,

Assistant Secretary, Energy and Minerals.

Part 715—GENERAL PERFORMANCE STANDARDS

Option 1 for § 715.19

1. Section 715.19 is amended by revising paragraphs (e)(2)(ii) through (vi) and adding paragraph (e)(2)(vii) to read as follows:

§ 715.19 Use of explosives.

- (e) * * *
- (2) *Blasting standards.* (i) * * *

(ii) In all blasting operations, except as otherwise authorized in this § 715.19, the maximum peak-particle-velocity of ground vibration shall not exceed the value established by the regulatory authority at the location of any dwelling, public building, school, church, or community or institutional building. Peak-particle-velocities shall be recorded in three mutually perpendicular directions. The maximum peak-particle-velocity shall be the largest of any of the three measurements.

(iii) The maximum peak-particle-velocity for surface coal mining blasting operations for a specific permit area shall be assigned by the regulatory authority based on an evaluation of the physical site conditions at and surrounding the permit area. Detailed information of the types of structures to be protected, seismic velocity, and other relevant information shall be submitted by the permittee for the regulatory authority to evaluate the allowable ground vibration standard. Permittees not requesting assignment of a site-specific peak-particle-velocity may choose to comply with the equation found in paragraph (e)(2)(vi) of this section.

(iv) The peak-particle-velocity authorized by the regulatory authority for surface blasting operations shall not

exceed the following limits for structure type and predominant frequency of the ground vibration due to blasting operations.

Type of structure*	Maximum peak-particle-velocity in inch/second allowable with seismic monitoring at indicated hertz value		
	<10 Hz	10 to 40 Hz	>40 Hz
1.....	0.50	0.50	0.50
2.....	0.75	1.0	2.0
3.....	1.0	1.5	2.0
4.....	2.0	2.0	2.0
5*			

*1. Sensitive or protected structures such as historic buildings, monuments, and residences with construction elements such as plaster interiors and rough stone foundation walls.

2. Older homes more than 20 years old with construction elements such as plaster-on-lath interiors and deteriorated or rigid, easily fractured construction materials.

3. Modern homes less than 20 years old with gypsum-board interior, reinforced concrete or concrete-masonry-unit foundations, and other wood-frame and wood-clad structure.

4. Structures with safety considerations such as water towers, impoundments, tunnels, pipelines, towers, and underground mines.

5. Buildings or structures designed to resist dynamic loads such as earthquake, wind, traffic, etc.

*Maximum peak-particle-velocity to be determined by a qualified registered professional engineer.

(v) The regulatory authority may authorize an operator to use the square-root scaled-distance equation $W=D/D_s^2$ without seismic monitoring, where W =the weight of explosive, in pounds, which may be detonated in any 8-millisecond period; D =the distance, in feet, from the blast to the nearest dwelling, school, church, or community or institutional building; and D_s =the scaled-distance factor (denominator of equation). The equation shall initially be approved based on the following correlation criteria:

Peak-particle-velocity (inch/second)	D_s (scaled-distance factor)
2.00.....	35
1.60.....	40
1.35.....	45
1.15.....	50
1.00.....	55
0.70.....	70
0.50.....	90

(vi) All surface coal operators choosing not to submit data for the regulatory authority to assign a site-specific ground-vibration limit shall utilize a scaled-distance equation $W=(D/70)^2$ for determining the maximum charge-weight of explosives that can be detonated within any 8-millisecond period without seismic monitoring, or limit all ground vibrations to a maximum peak-particle-velocity of 0.75 inch per second verified in seismographic records.

(vii) At the request of an owner or occupant of a structure in the vicinity of the mine, the regulatory authority shall evaluate data, including blast vibration frequency, type and condition of structure, or updated site information

and may lower the assigned peak-particle-velocity at any time necessary to prevent damage.

Option 2 for § 715.19

2. Section 715.19 is amended by revising paragraphs (e)(2)(ii) through (v) and removing paragraph (e)(2)(vi) to read as follows:

§ 715.19 Use of explosives.

(e) ***

(2) *Blasting standards.*—(i) ***

(ii) In all blasting operations, except as otherwise authorized in this § 715.19, the maximum ground vibration shall not exceed the values listed below at the location of any dwelling, school, church, or community or institutional building outside the permit area:

Distance to structure from blast site (feet)	Maximum ground-vibration limit allowable with seismic monitoring (inch/second) ¹
0-300 ²	1.60
301-500.....	1.35
501-1,000.....	1.20
1,001-3,000.....	1.00
3,001-5,000.....	0.90
beyond 5,001.....	0.75

¹Ground vibration recorded as the peak-particle-velocity. Particle velocity shall be recorded in three mutually perpendicular directions. The peak-particle-velocity shall be the largest of any of the three measurements.

²Subject to owner approval for dwellings; no mining may occur within 300 feet of public buildings.

(iii) The regulatory authority may approve the use of the equation $W=(D^{1.5})/90$ to determine the maximum allowable charge-weight of explosive to be detonated in any 8-millisecond delay period at distances greater than 300 feet. If blasting is conducted using this equation, the operator need not maintain seismographic records. W =the maximum weight of explosives, in pounds, and D =the distance, in feet, from the blast to the nearest dwelling, school, church, or community or institutional building.

(iv) At the request of an owner or occupant of a structure in the vicinity of the mine, the regulatory authority shall evaluate data, including blast vibration frequency, type and condition of structure, or updated site information and may lower the allowable maximum peak particle velocity at any time necessary to prevent change.

(v) The regulatory authority may require seismographic records of any and all blasts and may specify the location at which such measurements are taken.

Option 3 for § 715.19

3. Section 715.19 is amended by revising paragraph (e)(2)(ii) and removing paragraphs (e)(2)(iii) through (vi) to read as follows:

§ 715.19 Use of explosives.

(e) ***

(2) *Blasting standard.* (i) ***

(ii) *Ground vibration.* (A) Ground vibration shall not exceed a 1.0-inch-per-second peak-particle-velocity at the location of any dwelling or public building outside the permit area, unless the recorded ground vibration and frequency conform to the alternative blasting level criteria set forth in Figure 1. Peak-particle-velocity shall be recorded in three mutually perpendicular directions. The maximum particle-velocity shall be the largest of any of the three measurements. A seismographic record shall be provided for each blast.

(B) An operator may use the scaled-distance equation $W=(D/55)^2$ to determine the allowable charge-weight of explosives to be detonated in any 8-millisecond period, without seismic monitoring. W =the maximum weight of explosives, in pounds, and D =the distance, in feet, from the blast to the nearest dwelling, school, church, or community or institutional building.

(C) The use of an equation modified from that specified in § 715.19(e)(2)(ii)(B) to determine maximum weight of explosives per delay for blasting operations at a particular site may be approved by the regulatory authority, on receipt of a written request by the operator accompanied by reports including seismographic records of test blasting on the site. The predicted ground vibration would not exceed a peak-particle-velocity of 1.0 inch per second.

(D) At the request of an owner or occupant of a structure in the vicinity of the mine, the regulatory authority shall evaluate data, including blast vibration frequency, type and condition of structure, or updated site information and may lower the allowable maximum peak-particle-velocity at any time necessary to prevent damage.

(E) The regulatory authority may require a seismographic record including blast-vibration-frequency of any or all blasts and may specify the location at which such measurements are taken.

§ 715.19 [Amended]

4. Section 715.19 is amended by removing paragraph (e)(3) and

redesignating paragraph (e)(4) as paragraph (e)(3).

PART 780—SURFACE MINING PERMIT APPLICATION—MINIMUM REQUIREMENT FOR RECLAMATION AND OPERATION PLAN

5. Part 780 is amended by revising § 780.13 to read as follows:

§ 780.13 Operation plan: Blasting.

(a) *Blasting plan.* Each application shall contain a blasting plan for the proposed permit area, explaining how the applicant intends to comply with the requirements of 30 CFR 816.61 through 816.68. This plan shall include but is not restricted to descriptions of the limitations the operator will meet with regard to ground vibration and air blast and the methods to be applied in controlling the adverse effects of blasting operations.

(b) *Monitoring system.* Each application shall contain a description of the monitoring system to be used to ensure compliance with standards of § 816.67 including the type, capability, and sensitivity of any blast monitoring equipment and proposed procedures and locations of monitoring.

(c) *Blast design.* (1) A specific blast design shall be submitted if blasting operations will be conducted within—

(i) 1,000 feet of any building used as a dwelling, public building, school, or community or institutional building; or

(ii) 500 feet of underground mines; blasting plans within 500 feet of underground mines require approval by the Mine Safety and Health Administration (MSHA).

(2) The blast design above may be presented as part of a permit application or at a time specified by the regulatory authority.

(3) In the blast design the operator shall provide sketches of the specific drill patterns, delay periods, decking, type and amount of explosives to be used, critical dimensions, and the location and general description of structures to be protected, as well as a discussion of design factors to be used, which protect the public and meet the applicable airblast, ground vibration, and flyrock standards found in § 816.67.

(4) The blast design shall be prepared and signed by a certified blaster.

(5) The regulatory authority may require changes to the design submitted, if deemed necessary.

(6) Owners of property identified in paragraphs (c)(1)(i) or (ii) of this section shall be notified 30 days before blasting begins.

PART 816—PERMANENT PROGRAM PERFORMANCE STANDARDS—SURFACE MINING ACTIVITIES

§ 816.11 [Amended]

6. Section 816.11 is amended by removing paragraph (f) and redesignating paragraph (g) as paragraph (f).

7. Section 816.61 is revised to read as follows:

§ 816.61 Use of explosives: General requirements.

(a) Each operator shall comply with all applicable State and Federal laws in the use of explosives.

(b) Blasts that use more than 5 pounds of explosive or blasting agent shall be conducted according to the schedule required by § 816.64.

(c) A blaster certified under a program adopted pursuant to Subchapter M shall be responsible for all blasting operations including the transportation, storage, and use or destruction of explosives within a permit area.

8. Section 816.62 is revised to read as follows:

§ 816.62 Use of explosives: Preblasting survey.

(a) A resident or owner of a dwelling or structure within one-half mile of any part of the permit area may request a preblasting survey. This request shall be in writing and may be made either to the regulatory authority who will promptly notify the operator or directly to the operator. The operator shall promptly conduct a preblasting survey of the dwelling or structure and promptly prepare a written report of the survey. An updated survey of any additions, modifications, or renovations shall be performed by the operator if requested by the resident or owner.

(b) The operator shall determine the condition of the dwelling or structure and document any preblasting damage and other physical factors that could reasonably be affected by the blasting. Assessments of structures such as pipelines, cables, transmission lines, and wells, cisterns, and other water systems shall be limited to surface condition and readily available data. Special attention shall be given to the preblasting condition of wells, cisterns, and other water systems.

(c) The written report of the survey shall be signed by the person who conducted the survey, the original of the report shall be promptly provided to the regulatory authority, and copies shall be provided to the person requesting the survey. If the person requesting the survey disagrees with the contents and/or recommendations contained therein,

he or she may submit to both the permittee and the regulatory authority a detailed description of the specific areas of disagreement.

9. Section 816.64 is revised to read as follows:

§ 816.64 Use of explosives: Blasting schedules.

(a) *General requirements.* (1) The operator shall conduct blasting operations at times approved by the regulatory authority and announced in the blasting schedule. The regulatory authority may limit blasting, either in hours per day, times per day, or number of blasts per day. These limitations shall be based upon written submissions which demonstrate the necessity of the limitation in order to protect the public.

(2) *Unscheduled blasts* may be conducted where public or operator safety so requires, or for road construction or other difficult to schedule blasting actions. When an operator conducts an unscheduled blast incidental to a surface coal mining operation, the operator shall notify all residents within one-half mile of the blast area and document the reason in accordance with § 816.68(p).

(b) *Blasting schedule publication and distribution.* (1) The operator shall publish the blasting schedule in a newspaper of general circulation in the locality of the blasting site, at least 10 days, but not more than 30 days before beginning a blasting program.

(2) The operator shall distribute copies of the schedule to local governments and public utilities and to each local residence within one-half mile of the proposed blasting site described in the schedule. Copies sent to residences shall be accompanied by information advising the owner or resident how to request a preblasting survey.

(3) The operator shall republish and redistribute the schedule at least every 12 months and revise and republish the schedule at least 10 days, but not more than 30 days, prior to blasting when ever the area covered by the schedule changes or actual time periods for blasting significantly differ from the prior announcement.

(c) *Blasting schedule contents.* The blasting schedule shall contain at a minimum—

(1) Name, address, and telephone number of operator;

(2) Identification of the specific areas in which blasting will take place;

(3) Dates and time periods when explosives are to be detonated;

(4) Methods to be used to control access to the blasting area; and

(5) Type and patterns of audible warning and all-clear signals to be used before and after blasting.

§ 816.65 [Removed]

10. Section 816.65 is removed.

11. Section 816.66 is added as follows:

§ 816.66 Use of explosives: Blasting signs, warnings, and access control.

(a) The operator shall—

(1) Conspicuously display signs reading "Blasting Area" where a public road or right-of-way occurs within 100 feet of a blasting area or at the point where any other road provides access to the blasting area;

(2) Place at all entrances to the permit area from public roads or highways conspicuous signs which state "Warning! Explosives In Use," which clearly explain the blast warning and all-clear signals that are in use, and which explain the marketing of blast areas and charge holes within the permit area; and

(3) Prepare all signs to meet the requirements of § 816.11.

(b) Warning and all-clear signals of different character that are audible within a range of one-half mile from the point of the blast shall be given. Each person within the permit area and each person who resides or regularly works within one-half mile of the permit area shall be notified of the meaning of the signals in the blasting schedule.

(c) Access within the blasting area shall be controlled to prevent presence of livestock or unauthorized personnel during blasting and until an authorized representative of the operator has reasonably determined—

(1) That no unusual hazards exist, such as imminent slides or undetonated charges; and

(2) That access to and travel within the blasting area can be safely resumed.

12. Section 816.67 is revised to read as follows:

§ 816.67 Use of explosives: Control of adverse effects.

(a) *General requirements.* Blasting shall be conducted to prevent injury to persons, damage to public or private property outside the permit area, adverse impacts on any underground mine, and change in the course, channel, or availability of ground or surface waters outside the permit area.

(b) *Airblast.*—(1) *Limits.* (i) Airblast shall not exceed the maximum limits listed below at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area:

Lower frequency limit of measuring system, Hz (± 3 dB)	Maximum level in dB
2 Hz or lower—flat response	133 peak
6 Hz or lower—flat response	130 peak

(ii) The regulatory authority may reduce the maximum allowable airblast standard if necessary for continued compliance with damage prevention.

(iii) The operator shall minimize airblast so that it does not exceed the limits set by the regulatory authority even under adverse atmospheric conditions.

(2) *Monitoring.* (i) The regulatory authority may require airblast measurement of any or all blasts and may specify the location of such measurement.

(ii) In all cases, the measuring systems used must have an upper-end flat frequency response of at least 200 Hz.

(iii) The regulatory authority may approve the use of alternative measuring systems as long as such systems provide an equivalent monitoring level as listed above.

(c) *Flyrock.* Flyrock travelling in the air or along the ground shall not be cast from the blasting site—

(1) More than half the distance to the nearest dwelling or other occupied structure;

(2) Beyond the area of control required under § 816.66(c); nor

(3) Beyond the permit boundary.

Option 1 for § 816.67

13. Section 816.67 is amended by adding paragraph (d) to read as follows:

§ 816.67 Use of explosives: Control of adverse effects.

* * * * *

(d) *Ground Vibration.* (1) In all blasting operations, except as otherwise authorized in this § 816.67, the maximum peak-particle-velocity of ground vibration shall not exceed the value established by the regulatory authority at the location of any dwelling, public building, school, church, or community or institutional building. Peak-particle-velocities shall be recorded in three mutually perpendicular directions. The maximum peak-particle-velocity shall be the largest of any of the three measurements.

(2) The maximum peak-particle-velocity for surface coal mining blasting operations for a specific permit area shall be assigned by the regulatory authority based on an evaluation of the physical site conditions at and surrounding the permit area. Detailed information of the types of structures to be protected, seismic velocity, and other relevant information shall be submitted by the permittee by which to evaluate

the allowable ground-vibration standard as part of the permit application under 30 CFR 780.13. Permittees not requesting assignment of a site-specific peak-particle-velocity may choose to comply with the equation found in paragraph (d)(5) of this section.

(3) The peak-particle-velocity authorized by the regulatory authority for surface blasting operations shall not exceed the following limits for structure type and predominant frequency of the ground vibration due to blasting operations:

Type of structure *	Maximum peak-particle-velocity in inch/second allowable with seismic monitoring at indicated hertz value		
	<10 Hz	10 to 40 Hz	>40Hz
1.....	0.50	0.50	0.50
2.....	0.75	1.0	2.0
3.....	1.0	1.5	2.0
4.....	2.0	2.0	2.0
5 *			

*1. Sensitive or protected structures such as historic buildings, monuments, and residences with construction elements such as plaster interiors and rough stone foundation walls.

2. Older homes more than 20 years old with construction elements such as plaster-on-lath interiors and deteriorated or rigid, easily fractured construction materials.

3. Modern homes less than 20 years old with gypsum-board interior, reinforced concrete or concrete-masonry-unit foundations, and other wood-frame and wood-clad structure.

4. Structures with safety considerations such as water towers, impoundments, tunnels, pipelines, towers, and underground mines.

5. Buildings or structures designed to resist dynamic loads such as earthquake, wind, traffic, etc.

*Maximum peak-particle-velocity to be determined by a qualified registered professional engineer.

(4) The regulatory authority may authorize an operator to use the square-root scaled-distance equation $W=(D/D_s)^2$ without seismic monitoring, where W =the weight of explosive, in pounds, which may be detonated in any 8-millisecond period; D =the distance, in feet, from the blast to the nearest dwelling, school, church, or community or institutional building; and D_s =the scaled-distance factor (denominator of equation). The equation shall initially be approved based on the following correlation criteria:

Peak-particle-velocity (inch/second)	D_s (scaled-distance factor)
2.00.....	35
1.60.....	40
1.35.....	45
1.15.....	50
1.00.....	55
0.70.....	70
0.50.....	90

(5) All surface coal operators choosing not to submit data for the regulatory authority to assign a site-specific ground-vibration limit shall utilize a scaled-distance equation $W=(D/70)^2$ for determining the maximum charge-weight of explosives that can be detonated within any 8-millisecond period without seismic monitoring, or

limit all ground vibrations to a maximum peak-particle-velocity of 0.75 inch per second verified in seismographic records.

(6) At the request of an owner or occupant of a structure in the vicinity of the mine, the regulatory authority shall evaluate data, including blast vibration frequency, type and condition of structure, or updated site information and may lower the assigned peak-particle-velocity at any time necessary to prevent damage.

Option 2 for § 816.67

14. Section 816.67 is amended by adding paragraph (d) to read as follows:

§ 816.67 Use of explosives: Control of adverse effects.

(d) *Ground vibration.* (1) In all blasting operations, except as otherwise authorized in this section, the maximum ground vibration shall not exceed the values listed below at the location of any dwelling, school, church, or community or institutional building outside the permit area:

Distance to structure from blast site (feet)	Maximum ground-vibration limit allowable with seismic monitoring (inch/second) ¹
0-300 ²	1.80
301-500	1.35
501-1,000	1.20
1,001-3,000	1.00
3,001-5,000	0.90
beyond 5,001	0.75

¹ Ground vibration recorded as the peak-particle-velocity. Particle velocity shall be recorded in three mutually perpendicular directions. The peak-particle-velocity shall be the largest of any of the three measurements.

² Subject to owner approval for dwellings; no mining may occur within 300 feet of public buildings.

(2) The regulatory authority may approve the use of the equation $W=(D^{1.5})/90$ to determine the maximum allowable charge-weight of explosive to be detonated in any 8-millisecond delay period at distances greater than 300 feet. If blasting is conducted using this equation, the operator need not maintain seismographic records. W =the maximum weight of explosives, in pounds, and D =the distance, in feet, from the blast to the nearest dwelling, school, church, or community or institutional building.

(3) At the request of an owner or occupant of a structure in the vicinity of the mine, the regulatory authority shall evaluate data, including blast vibration frequency, type and condition of structure, or updated site information and may lower the allowable maximum peak-particle-velocity at any time necessary to prevent damage.

(4) The regulatory authority may require seismographic records of any and all blasts and may specify the

location at which such measurements are taken.

Option 3 for § 816.67

15. Section 816.67 is amended by adding paragraphs (d) and (e) to read as follows:

§ 816.67 Use of explosives: Control of adverse effects.

(d) *Ground vibration.* (1) Ground vibration shall not exceed a 1.0-inch-per-second peak-particle-velocity at the location of any dwelling or public building outside the permit area, unless the recorded ground vibration and frequency conform to the alternative blasting level criteria set forth in Figure 1. Peak-particle-velocity shall be recorded in three mutually perpendicular directions. The maximum particle-velocity shall be the largest of any of the three measurements. A seismographic record shall be provided for each blast.

(2)(i) An operator may use the scaled-distance equation $W=(D/55)^2$ to determine the allowable charge-weight of explosives to be detonated in any 8-millisecond period, without seismic monitoring. W =the maximum weight of explosives, in pounds, and D =the distance, in feet, from the blast to the nearest dwelling, school, church, or community or institutional building.

(ii) The use of an equation modified from that specified in § 816.67(d)(2)(i) to determine maximum weight of explosives per delay for blasting operations at a particular site may be approved by the regulatory authority, on receipt of a written request by the operator accompanied by reports including seismographic records of test blasting on the site. The predicted ground vibration would not exceed a peak-particle-velocity of 1.0 inch per second.

(3) At the request of an owner or occupant of a structure in the vicinity of the mine, the regulatory authority shall evaluate data, including blast vibration frequency, type and condition of structure, or updated site information and may lower the allowable maximum peak-particle-velocity at any time necessary to prevent damage.

(4) The regulatory authority may require a seismographic record, including blast-vibration-frequency of any or all blasts and may specify the location at which such measurements are taken.

(e) If blasting is conducted in accordance with § 816.67(a), the maximum ground vibration and/or airblast standard shall not apply at the following locations:

(1) At structures owned by the person conducting the mining activity and not leased to another party; and

(2) At structures owned by the person conducting the mining activity and leased to another party, if a written waiver by the lessee is submitted to the regulatory authority prior to blasting.

16. Section 816.68 is revised to read as follows:

§ 816.68 Use of explosives: Records of blasting operations.

The operator shall retain a record of all blasts for at least 3 years. Copies of these records shall be made available upon request to the regulatory authority and to the public for inspection; such records shall contain the following data:

(a) Name of the operator conducting the blast.

(b) Location, date, and time of the blast.

(c) Name, signature, and license number of the blaster conducting the blast.

(d) Identification, direction, and distance in feet to the nearest dwelling, school, church, or community or institutional building outside the permit area, except those cited under 30 CFR 816.67(e).

(e) Weather conditions.

(f) Type of material blasted.

(g) Sketches of the blast pattern including number of holes, burden, spacing, decks, and delay pattern.

(h) Diameter and depth of holes.

(i) Types of explosives used.

(j) Total weight of explosives used per hole.

(k) The maximum weight of explosives detonated in an 8-millisecond period.

(l) Initiation system.

(m) Type and length of stemming.

(n) Mats or other protections used.

(o) Seismographic and airblast records, if required, which shall include—

(1) Type of instrument, sensitivity, and calibration signal;

(2) Exact location of instrument and the date, time, and distance from the blast;

(3) Name of the person and/or firm taking the reading;

(4) Name of the person and firm analyzing the seismographic record; and

(5) The vibration and/or airblast level recorded.

(p) Reasons and conditions for each unscheduled blast and a list of persons within one-half mile of the blast area who were orally notified of the unscheduled blast.

PART 817—PERMANENT PROGRAM PERFORMANCE STANDARDS—UNDERGROUND MINING ACTIVITIES

§ 817.11 [Amended]

17. Section 817.11 is amended by removing paragraph (f) and redesignating paragraph (g) as paragraph (f).

18. Section 817.61 is revised to read as follows:

§ 817.61 Use of explosives: General requirements.

(a) Sections 817.61 through 817.68 apply to surface blasting activities incident to underground coal mining, including, but not limited to, initial rounds of slopes and shafts.

(b) Each operator shall comply with all applicable State and Federal laws in the use of explosives and the requirements of §§ 817.61–817.68.

(c) A blaster certified under a program pursuant to Subchapter M shall be responsible for all blasting operations including the transportation, storage, use, or destruction of explosives within a permit area.

19. Section 817.62 is revised to read as follows:

§ 817.62 Use of explosives: Preblasting survey.

(a) A resident or owner of a dwelling or structure within one-half mile of any part of the permit area may request a preblasting survey. This request shall be in writing and may be made either to the regulatory authority who will promptly notify the operator or directly to the operator. The operator shall promptly conduct a preblasting survey of the dwelling or structure and promptly prepare a written report of the survey. An updated survey of any additions, modifications, or renovations shall be performed by the operator if requested by the resident or owner.

(b) The operator shall determine the condition of the dwelling or structure and document any preblasting damage and other physical factors that could reasonably be affected by the blasting. Assessments of structures such as pipelines, cables, transmission lines, and wells, cisterns, and other water systems shall be limited to surface condition and readily available data. Special attention shall be given to the preblasting condition of wells, cisterns, and other water systems.

(c) The written report of the survey shall be signed by the person who conducted the survey, the original of the report shall be promptly provided to the regulatory authority, and copies shall be provided to the person requesting the survey. If the person requesting the

survey disagrees with the contents and/or recommendations contained therein, he or she may submit to both the permittee and the regulatory authority a detailed description of the specific areas of disagreement.

(d) The operator shall provide information advising the owner or resident of a dwelling or other structure located within one-half mile of the permit area how to request a preblasting survey.

20. Section 817.64 is revised to read as follows:

§ 817.64 Use of explosives: General performance standards.

(a) A resident or owner of a dwelling or structures that is located within one-half mile of any area affected by surface blasting activities shall be notified by the operator approximately 24 hours prior to any surface blasting event.

(b) The regulatory authority may specify restrictive time periods when blasting may be conducted based on submission in writing of relevant information deemed necessary to protect the public.

§ 817.65 [Removed]

21. Section 817.65 is removed.

22. Section 817.66 is added as follows:

§ 817.66 Use of explosives: Blasting signs, warnings, and access control.

(a) If blasting is conducted incidental to surface mining activities, the operator shall—

(1) Conspicuously display signs reading "Blasting Area" where a public road or right-of-way occurs within 100 feet of a blasting area or at the point where any other road provides access to the blasting area;

(2) Place at all entrances to the permit area from public roads or highways conspicuous signs which state "Warning! Explosives In Use," which clearly explain the blast warning and all-clear signals that are in use, and which explain the marking of blast areas and charge holes within the permit area; and

(3) Prepare all signs to meet the requirements of § 817.11.

(b) Warning and all-clear signals of different character that are audible within a range of one-half mile from the point of the blast shall be given. Each person within the permit area and each person who resides or regularly works within one-half mile of the permit area shall be notified of the meaning of the signals in the blasting schedule.

(c) Access within the blasting areas shall be controlled to prevent presence of livestock or unauthorized personnel during blasting and until an authorized

representative of the operator has reasonably determined—

(1) That no unusual hazards exist; such as imminent slides or undetonated charges; and

(2) That access to and travel within the blasting areas can be safely resumed.

23. Section 817.67 is revised to read as follows:

§ 817.67 Use of explosives: Control of adverse effects.

(a) *General requirements.* Blasting shall be conducted to prevent injury to persons, damage to public or private property outside the permit area, adverse impacts on any underground mine, and change in the course, channel, or availability of ground or surface waters outside the permit area.

(b) *Airblast.*—(1) *Limits.* (i) Airblast shall not exceed the maximum limits listed below at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area:

Lower frequency limit of measuring system, Hz (± 3 dB)	Maximum level in dB
2 Hz or lower—flat response.....	133 peak
6 Hz or lower—flat response.....	130 peak

(ii) The regulatory authority may reduce the maximum allowable airblast standard if necessary for continued compliance with damage prevention.

(iii) The operator shall minimize airblast so that it does not exceed the limits set by the regulatory authority even under adverse atmospheric conditions.

(2) *Measurement.* (i) The regulatory authority may require airblast measurement of any or all blasts and may specify the location of such measurement.

(ii) Measuring systems must have an upper-end flat frequency response of at least 200 Hz.

(iii) The regulatory authority may approve the use of alternative measuring systems as long as such systems provide an equivalent monitoring level as listed above.

(c) *Flyrock.* Flyrock travelling in the air or along the ground shall not be cast from the blasting site—

(1) More than half the distance to the nearest dwelling or other occupied structure;

(2) Beyond the area of control required under § 816.66(c); nor

(3) Beyond the permit boundary.

Option 1 for § 817.67

24. Section 817.67 is amended by adding paragraph (d) to read as follows:

§ 817.67 Use of explosives: Control of adverse effects.

(d) *Ground vibrations.* (1) In all blasting operations, except as otherwise authorized in this § 817.67, the maximum peak-particle-velocity of ground vibration shall not exceed the value established by the regulatory authority at the location of any dwelling, public building, school, church, or community or institutional building. Peak-particle-velocities shall be recorded in three mutually perpendicular directions. The maximum peak-particle-velocity shall be the largest of any of the three measurements.

(2) The maximum peak-particle-velocity for surface coal mining blasting operations for a specific permit area shall be assigned by the regulatory authority based on an evaluation of the physical site conditions at and surrounding the permit area. Detailed information of the types of structures to be protected, seismic velocity, and other relevant information shall be submitted by the permittee by which to evaluate the allowable ground-vibration standard as part of the permit application under 30 CFR 780.13. Permittees not requesting assignment of a site-specific peak-particle-velocity may choose to comply with the equation found in paragraph (d)(5) of this section.

(3) The peak-particle-velocity authorized by the regulatory authority for surface blasting operations shall not exceed the following limits for structure type and predominant frequency of the ground vibration due to blasting operations:

Type of structure*	Maximum peak-particle-velocity in inch/second allowable with seismic monitoring at indicated hertz value		
	<10 Hz	10 to 40 Hz	>40 Hz
1.....	0.50	0.50	0.50
2.....	0.75	1.0	2.0
3.....	1.0	1.5	2.0
4.....	2.0	2.0	2.0
5 ^b			

*1. Sensitive or protected structures such as historic buildings, monuments, and residences with construction elements such as plaster interiors and rough stone foundation walls.

2. Older homes more than 20 years old with construction elements such as plaster-on-lath interiors and deteriorated or rigid, easily fractured construction materials.

3. Modern homes less than 20 years old with gypsum-board interior, reinforced concrete or concrete-masonry-unit foundations, and other wood-frame and wood-clad structures.

4. Structures with safety considerations such as water towers, impoundments, tunnels, pipelines, towers, and underground mines.

5. Buildings or structures designed to resist dynamic loads such as earthquake, wind, traffic, etc.

^bMaximum peak-particle-velocity to be determined by a qualified registered professional engineer.

(4) The regulatory authority may authorize an operator to use the square-root scaled-distance equation $W=(D/D_s)^2$ without seismic monitoring, where W =the weight of explosive, in pounds, which may be detonated in any 8-

millisecond period; D =the distance, in feet, from the blast to the nearest dwelling, school, church, or community or institutional building; and D_s =the scaled-distance factor (denominator of equation). The equation shall initially be approved based on the following correlation criteria:

Peak-particle-velocity (inch/second)	D_s (scaled-distance factor)
2.00.....	35
1.60.....	40
1.35.....	45
1.15.....	50
1.00.....	55
0.70.....	70
0.50.....	90

(5) All surface coal operators choosing not to submit data for the regulatory authority to assign a site-specific ground-vibration limit shall utilize a scaled-distance equation $W=(D/70)^2$ for determining the maximum charge-weight of explosives that can be detonated within any 8-millisecond period without seismic monitoring, or limit all ground vibrations to a maximum peak-particle-velocity of 0.75 inch per second verified in seismographic records.

(6) At the request of an owner or occupant of a structure in the vicinity of the mine, the regulatory authority shall evaluate data, including blast vibration frequency, type and condition of structure, or updated site information and may lower the assigned peak-particle-velocity at any time necessary to prevent damage.

Option 2 for § 817.67

25. Section 817.67 is amended by adding paragraph (d) to read as follows:

§ 817.67 Use of explosives: Control of adverse effects.

(d) *Ground vibration.* (1) In all blasting operations, except as otherwise authorized in this § 817.67, the maximum ground vibration shall not exceed the values listed below at the location of any dwelling, school, church, or community or institutional building outside the permit area:

Distance to structure from blast site (feet)	Maximum ground-vibration limit allowable with seismic monitoring (inch/second) ¹
0-300 ²	1.60
301-500.....	1.35
501-1,000.....	1.20
1,001-3,000.....	1.00
3,001-5,000.....	0.90
beyond 5,001.....	0.75

¹Ground vibration recorded as the peak-particle-velocity. Particle velocity shall be recorded in three mutually perpendicular directions. The peak-particle-velocity shall be the largest of any of the three measurements.

²Subject to owner approval for dwellings; no mining may occur within 300 feet of public buildings.

(2) The regulatory authority may approve the use of the equation $W=(D^{1.5})/90$ to determine the maximum allowable charge-weight of explosive to be detonated in any 8-millisecond delay period at distances greater than 300 feet. If blasting is conducted using this equation, the operator need not maintain seismographic records. W =the maximum weight of explosives, in pounds, and D =the distance, in feet, from the blast to the nearest dwelling, school, church, or community or institutional building.

(3) At the request of an owner or occupant of a structure in the vicinity of the mine, the regulatory authority shall evaluate data, including blast vibration frequency, type and condition of structure, or updated site information and may lower the allowable maximum peak-particle-velocity at any time necessary to prevent damage.

(4) The regulatory authority may require seismographic records of any and all blasts and may specify the location at which such measurements are taken.

Option 3 for § 817.67

26. Section 817.67 is amended by adding paragraphs (d) and (e) to read as follows:

§ 817.67 Use of explosives: Control of adverse effects.

(d) *Ground vibration.* (1) Ground vibration shall not exceed a 1.0-inch-per-second peak-particle-velocity at the location of any dwelling or public building outside the permit area, unless the recorded ground vibration and frequency conform to the alternative blasting level criteria set forth in Figure 1. Peak-particle-velocity shall be recorded in three mutually perpendicular directions. The maximum particle-velocity shall be the largest of any of the three measurements. A seismographic record shall be provided for each blast.

(2)(i) An operator may use the scaled-distance equation, $W=(D/55)^2$ to determine the allowable charge-weight of explosives to be detonated in any 8-millisecond period, without seismic monitoring. W =the maximum weight of explosives, in pounds, and D =the distance, in feet, from the blast to the nearest dwelling, school, church, or community or institutional building.

(ii) The use of an equation modified from that specified in § 817.67(d)(2)(i) to determine maximum weight of explosives per delay for blasting

operations at a particular site may be approved by the regulatory authority, on receipt of a written request by the operator accompanied by reports including seismographic records of test blasting on the site. The predicted ground vibration would not exceed a peak-particle-velocity of 1.0 inch per second.

(3) At the request of an owner or occupant of a structure in the vicinity of the mine, the regulatory authority shall evaluate data, including blast vibration frequency, type and condition of structure, or updated site information and may lower the allowable maximum peak-particle-velocity at any time necessary to prevent damage.

(4) The regulatory authority may require a seismographic record, including blast-vibration-frequency of any or all blasts and may specify the location at which such measurements are taken.

(e) If blasting is conducted in accordance with § 816.67(a), the maximum ground vibration and/or airblast standard shall not apply at the following locations:

(1) At structures owned by the person conducting the mining activity and not leased to another party; and

(2) At structures owned by the person conducting the mining activity and leased to another party, if a written waiver by the lessee is submitted to the regulatory authority prior to blasting.

27. Section 817.68 is revised to read as follows:

§ 817.68 Use of explosives: Records of blasting operations.

The operator shall retain a record of all blasts for at least 3 years. Copies of these records shall be made available to the regulatory authority on request and to the public for inspection; such records shall contain the following data:

(a) Name of the operator conducting the blast.

(b) Location, date, and time of the blast.

(c) Name, signature, and license number of the blaster conducting the blast.

(d) Identification, direction, and distance in feet to the nearest dwelling, school, church, or community or institutional building outside the permit area, except those cited under § 817.67(e).

(e) Weather conditions.

(f) Type of material blasted.

(g) Sketches of the blast pattern including burden, spacing, decks, and delay pattern.

(h) Diameter and depth of holes.

(i) Types of explosives used.

(j) Total weight of explosives used per hole.

(k) The maximum weight of explosives detonated in an 8-millisecond period.

(l) Initiation system.

(m) Type and length of stemming.

(n) Mats or other protections used.

(o) Seismographics and airblast records, if required, which shall include—

(1) Type of instrument, sensitivity, and calibration signal;

(2) Exact location of instrument and the date, time, and distance from the blast;

(3) Name of the person and/or firm taking the reading;

(4) Name of the person and firm analyzing the seismographic record; and

(5) The vibration and/or airblast level recorded.

28. Figure 1 is added following the text of Option 3 of §§ 715.19(e)(2)(ii)(A), 816.67(d)(1), and 817.67(d)(1) to read as follows:

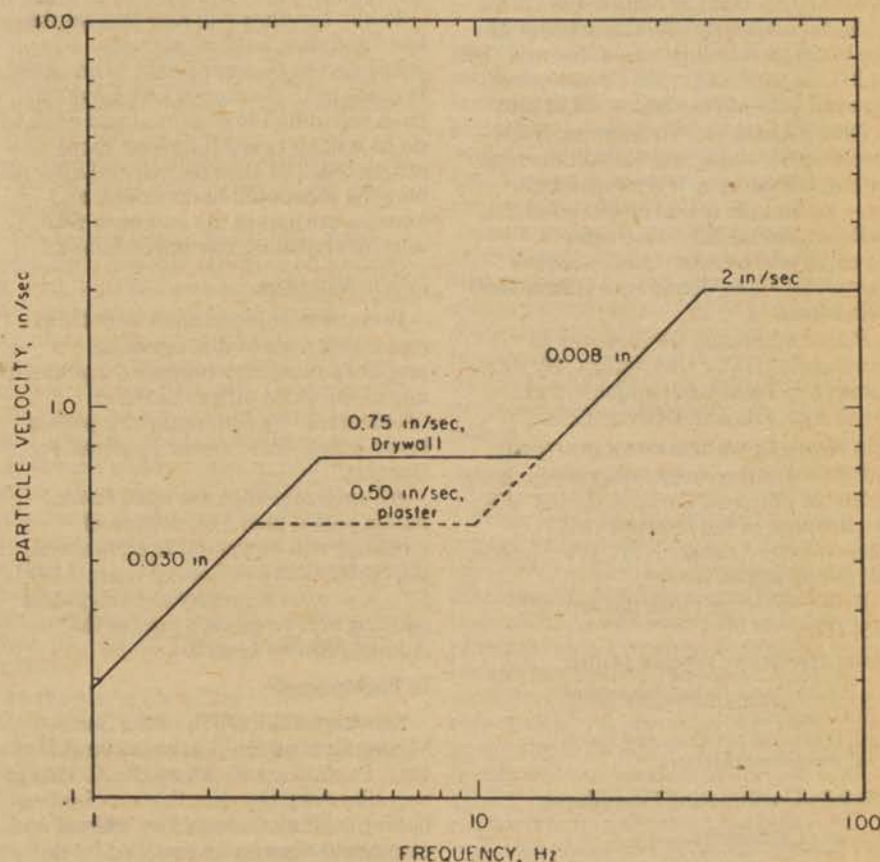


Figure 1.--Alternative blasting level criteria. (Source: Figure B-1 from Bureau of Mines RI8507.)

(Pub. L. 95-87; 30 U.S.C. Section 1201 *et seq.*)
[FR Doc. 82-7918 Filed 3-23-82; 8:45 am]
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DEPARTMENT OF THE INTERIOR

30 CFR Part 850

**Permanent Regulatory Program;
Training, Examination, and
Certification of Blasters**

AGENCY: Office of Surface Mining
Reclamation and Enforcement, Interior.

ACTION: Proposed rule.

SUMMARY: The Office of Surface Mining

Reclamation and Enforcement (OSM) is proposing amendments to its rules governing the training, examination, and certification of persons engaging in or directly responsible for blasting or the use of explosives in surface coal mining operations. The purpose of these amendments would be to give responsibility for training, examining, and certifying blasters to those States with State programs in effect regulating surface coal mining. OSM would retain such responsibility on Federal lands and in those States where the State has not become the regulatory authority. The detailed regulations currently in place would be replaced with a more general regulatory framework.

DATES:

Written comments: Accepted until 5 p.m. (eastern time) on April 23, 1982.

Public hearings: Held on request only, on April 16, 1982, at 9:00 a.m.

Public meetings: Scheduled on request only.

ADDRESSES:

Written comments: Hand-deliver to the Office of Surface Mining, U.S. Department of the Interior, Administrative Record (TSR 14.31), Room 5315, 1100 L Street, NW., Washington, D.C.; or mail to the Office of Surface Mining, U.S. Department of the Interior, Administrative Record (TSR 14.31), Room 5315L, 1951 Constitution Avenue, NW., Washington, DC 20240.

Public hearings: Washington, D.C.—Department of the Interior Auditorium, 18th and C Streets, NW.; Pittsburgh, Pa.—William S. Moorehead Federal Building, Room 2212, 1000 Liberty Avenue; and Denver, Colo.—Brooks Tower, 2d Floor Conference Room, 1020 15th Street.

Public meetings: OSM offices in Washington, D.C.; Charleston, W. Va.; Knoxville, Tenn.; Indianapolis, Ind.; Pittsburgh, Pa.; and Denver, Colo.

FOR FURTHER INFORMATION CONTACT:

Public hearings and information: Jerry R. Ennis, Office of Surface Mining, U.S. Department of the Interior, 1951 Constitution Avenue, NW., Washington, DC 20240; 202-343-7887.

Public meetings: Jose del Rio, 202-343-4022.

SUPPLEMENTARY INFORMATION:

- I. Public Commenting Procedures.
- II. Background.
- III. Discussion of Proposed Rules.
- IV. Procedural Matters.

I. Public Commenting Procedures*Written Comments*

Written comments should be specific, pertain only to the issues proposed in this rulemaking, and include explanations in support of the commenter's recommendations. Comments are requested to submit five copies of their comments (see "Addressee"). Comments received after the time indicated under "Dates" or at locations other than Washington, D.C., will not necessarily be considered or be included in the Administrative Record for the final rulemaking.

Public Hearings

Persons wishing to comment at the public hearings should contact the person listed under "For Further Information Contact" by the close of business three working days before the date of the hearing. If no one requests to comment at a public hearing at a

particular location by that date, the hearing will not be held. If only one person requests to comment, a public meeting, rather than a public hearing, may be held and the results of the meeting included in the Administrative Record.

Filing of a written statement at the time of the hearing is requested and will greatly assist the transcriber. Submission of written statements in advance of the hearing will allow OSM officials to prepare appropriate questions.

Public hearings will continue on the specified date until all persons scheduled to comment have been heard. Persons in the audience who have not been scheduled to comment and wish to do so will be heard following those scheduled. The hearing will end after all persons scheduled to comment, and persons present in the audience who wish to comment, have been heard.

Public Meetings.

Persons wishing to meet with OSM representatives to discuss these proposed rules may request a meeting at any of the OSM offices listed in "Addresses" by contacting the person listed under "For Further Information Contact."

All such meetings are open to the public and, if possible, notices of meetings will be posted in advance in the Administrative Record room (1100 L St.). A written summary of each public meeting will be made a part of the Administrative Record.

II. Background

Section 515(b)(15)(D) of the Surface Mining Control and Reclamation Act of 1977, Public Law 95-87, 30 U.S.C. 1201 *et seq.* (the Act), requires that all blasting operations be conducted by trained and competent persons as certified by the regulatory authority. Section 719 of the Act directs that regulations be promulgated which require "the training, examination, and certification of persons engaging in or directly responsible for blasting or use of explosives in surface coal mining operations." Section 719 also states that such regulations may be promulgated by the "Secretary of the Interior (or the approved State regulatory authority as provided for in Section 503 of this Act)." Final regulations to implement these sections were published at 45 FR 82084-82100 (December 12, 1980). Previous proposals were published at 43 FR 41934 (September 18, 1978) and at 44 FR 38318 (June 29, 1979).

On January 28, 1981, the Secretary of the Interior ordered that all regulations which were excessive, burdensome, or counterproductive be identified and

asked States and industry to recommend sections to be revised. OSM, in compliance with the administrative mandate to simplify and remove excessive regulatory burdens, is repropounding the rules governing training, examination, and certification of blasters in surface operations of coal mines.

In the December 12, 1980, rules adopting the current program, 30 CFR Part 850, OSM interpreted Section 719 of the Act as providing statutory authority to promulgate rules for a comprehensive national program to train, examine, and certify "blasters-in-charge," a regulatory term not found in the Act (45 FR 82092-94). In keeping with the current Administration's desire that State governments have more choice and flexibility, wherever possible, in carrying out the provisions of the Act, OSM is now of the opinion that the States that have achieved primacy should have the opportunity to promulgate their own blaster training, examination, and certification programs. In such States, this would allow program variations to account for regional and local conditions. In section 719, the parenthetical "(or the approved State regulatory authority . . .)" provides the necessary statutory authority. The Secretary of the Interior would be responsible for establishing rules governing training, examination, and certification of blasters in States with Federal programs and on Federal lands (except for such lands in States with cooperative agreements), and the State regulatory authorities would be responsible in States with State programs.

Regulatory authorities would be required to carry out Congress intent that all blasting operations be conducted by qualified and trained blasters. Under the proposed rule, each State could choose and develop the method of training, examining, and certifying blasters which best meets local needs while complying with the general requirements proposed herein. Thus, it is proposed that the December 12, 1980, rules be deleted and the new proposal, described in more detail below, be adopted.

OSM's first rules for blaster training and certification, as proposed on September 18, 1978, were a comprehensive program which would have required that—

(1) All members of blasting crews and all blasters-in-charge must be certified through training, and such training must be specifically approved by OSM;

(2) All blasters-in-charge must be certified by passing an examination established by OSM as well as meeting a 2-year experience requirement;

(3) All blasters-in-charge and crew members must renew certification every 3 years through completion of mandatory training; and

(4) Blasting crews must have no more than six crew members for every blaster-in-charge.

In response to comments received on these first proposed rules, OSM decided that several substantive changes should be made, and it was therefore necessary to repropose blaster training and certification rules. Accordingly, the June 29, 1979, repropose rules would have eliminated all requirements for mandatory training, though regulatory authorities were still required to develop and provide to operators a training course that would cover all certification requirements. This second set of proposed rules still required certification of blasters-in-charge through an OSM-developed examination and experience requirement, but dropped all requirements for blasting crew members, with the exception that blasters-in-charge must ensure that crew members had adequate training to perform assigned blasting duties.

Additionally, recertification requirements of blasters-in-charge were limited to minimal retesting and experience, and allowable size of blasting crews was expanded from six to twelve crew members per blaster-in-charge.

In the December 12, 1980, final rules, all major elements of the repropose rules were retained. In particular, existing § 850.12(a)(1) requires that each permittee "designate a blaster-in-charge for each blast to be detonated in surface coal mining and reclamation operations," and existing § 850.12(b) (3) and (4) require that the blaster-in-charge "directly supervise blast preparation and execution at the blast site to ensure that such [blast] standards are met" and "be present at the site when the blast is detonated." These rules were challenged and on May 19, 1981, in *Peabody Coal Company v. Watt*, Civil Action No. 81-300, the United States District Court for the District of Columbia addressed the question as to whether a single blaster-in-charge must supervise every aspect of a particular blast. In a consent order the court concluded that successive blasters-in-charge would satisfy the rules; that is, at each, relevant time there must be an identified individual acting as the responsible blaster-in-charge, but not necessarily the same individual. The proposed rules would eliminate the concept of blaster-in-charge and would require only that the blast be fired under the direction of a certified blaster.

OSM is required, by the consent order, to raise the following two questions for further consideration by the public when related rules as to qualification requirements for blasters-in-charge are proposed (as was then planned by OSM):

(A) Whether, consistent with Section 719 of the Act, the Secretary can promulgate, for a State regulatory authority, national rules pertaining to blaster training and certification, or whether the State regulatory authority, pursuant to Section 719, is solely responsible for such rules; and

(B) Whether aspects of the blaster training rules amount to work practice standards and whether such practices are authorized by the Act.

The public is requested to respond to these two questions in light of the new proposals.

While the December 12, 1980, rules technically became effective on January 12, 1981, Part 850 was promulgated without blaster qualification and experience requirements that were necessary to implement the regulatory scheme. (See 45 FR 82087, December 12, 1980.) Accordingly, while States have been given the responsibility to prepare and submit blaster training and certification elements to OSM for inclusion in their permanent State programs, no State has been required to comply with Part 850 because no blaster qualification and experience requirements have been promulgated by OSM. (See 45 FR 82091, December 12, 1980.)

In the preamble to the rule of December 12, 1980, OSM expressed its belief that it was required to follow the *Uniform Guidelines on Employee Selection Procedures*, 29 CFR Chapter XIV, Part 1607, because of equal employment opportunity requirements and potential liability under Title VII of the Civil Rights Act of 1964, 42 U.S.C. Section 2000 *et seq.* Because Title VII may also apply to State development of blaster certification programs, OSM suggests that in complying with the proposed rules, State regulatory authorities could consult authoritative sources, such as the *Uniform Guidelines*, in developing adequate training parameters, standards to evaluate competence, and effective programs for ensuring continued compliance by those persons licensed. In addition, States may wish to consider aspects of reciprocal certification to facilitate mining operations and employment trends from State to State.

State regulatory authorities and others were asked to comment on draft proposed rules in July 1981. The responses were generally favorable.

Some States, such as West Virginia and Wyoming, have undertaken to develop tests in anticipation of the adoption of these rules. Other States have demonstrated a cooperative effort in dealing with reciprocity and interstate problems. Other States, such as Kentucky and Pennsylvania, have existing programs for blaster certification and may choose, if a final rule is adopted, to submit to OSM a variation of these programs.

III. Discussion of Proposed Rules

The proposed rules are divided into several sections under Part 850. These sections provide the regulatory framework for a State to develop its individual program. Broad criteria are included for training, examination, and certification. These would replace both the general national program requirements of the current rules pertaining to blasters-in-charge, crew size, numbers of persons supervised, etc., presently contained in § 850.12, and other training and certification requirements set forth in existing §§ 850.13 and 850.14, respectively. The proposed amendments are discussed below.

Applicability and Responsibility

Proposed § 850.11 provides that the blaster rules would apply to the regulatory authorities responsible under Sections 503, 504, and 523 of the Act for implementing and enforcing permanent program rules. Proposed § 850.12 is a broad statement of responsibility that would make the regulatory authority responsible for promulgating rules governing the training, examination, and certification of blasters in surface coal mining operations. These rules would be required to be submitted to OSM for approval under 30 CFR Parts 731 and 732 when the regulatory authority is a State. OSM also will promulgate additional rules for those situations where it is the regulatory authority for a State with a Federal program. In addition, OSM intends to adopt a blaster certification program for Federal lands in States without cooperative agreements. OSM believes that blasters within a State should not have to meet two different sets of certification requirements. Thus, comments are specifically requested as to whether the Federal lands blaster certification program should be the same in each State as the blaster certification program adopted by the regulatory authority for non-Federal lands in that State. For Federal lands in States where cooperative agreements are executed, State blaster certification programs would satisfy OSM's training, examination, and certification role.

OSM proposes to eliminate the current provision in § 850.4 that places specific responsibilities upon the Director of OSM, each Regional Director of OSM, and the States, respectively. Current rules that would be deleted make the Director of the OSM responsible for (1) establishing technically valid national examinations for blaster certification, (2) establishing valid national experience requirements for blaster certification, and (3) developing training course materials. In addition, OSM would no longer be required to provide training assistance.

Time Frame

Proposed § 850.12(b) would require the regulatory authority to develop and adopt a program to examine and certify all persons who intend to engage in the use of explosives for blasting in a surface coal mining operation. The program would have to be adopted within 12 months after the promulgation of a final rule in this rulemaking or 12 months after a State program is approved or a Federal program is implemented, whichever is later. This period has been set at 12 months in order to allow the development and collection of data, testing procedures, and other aspects of program development. Comments are requested with respect to the time frame for implementation. Under State programs, Federal programs, or Federal land programs, all blasters with responsibility for the use of explosives within a permit area would be required to be certified within 6 months of the adoption of a blaster certification program.

Training

According to proposed § 850.13, the regulatory authority would have to ensure that blasters receive training, including but not limited to technical aspects of blasting operations and the requirements of State and Federal laws governing the storage, transportation, and use of explosives. The proposed rule would also require that inexperienced persons placed on blasting crews receive direction and on-the-job training from certified blasters. This would ensure that workers involved in the use of explosives receive direction from trained persons who are knowledgeable in the proper use and handling of explosives.

Section 850.13(b) would require training courses to be available and would set forth specific subjects to be included in training courses. Comments are requested as to whether the list of subjects is inadequate or too extensive.

Examination

As noted in the preamble to the rules of December 12, 1980, at 45 FR 82093 and 82094, commenters objected to nationwide certification requirements, especially an examination to measure competence to be developed by OSM and to be used by all regulatory authorities. One of the alternatives discussed was to leave certification requirements to the States. That alternative was partially rejected at that time because of OSM's concern that States would be unable to develop valid certification tests. On the other hand, the December 12, 1980, rule acknowledged that then current rules allowed States to develop their own valid tests and to submit them for OSM approval under the State window rules of § 731.13. At this time, rather than relying upon a presumption that States will be unable to develop valid tests, OSM has tentatively concluded that the regulatory authorities should be given the initial responsibility of developing their own valid certification tests within the parameters of proposed § 850.14. Only when the States have demonstrated an actual inability to develop valid tests would OSM be required to step in.

Under proposed § 850.14, the regulatory authority or other agency designated by the regulatory authority would be required to examine candidates for blaster certification by (1) reviewing and verifying the competence of persons engaged in the use of explosives in surface coal mining operations through a written examination in technical aspects of blasting and State and Federal laws governing the storage, use, and transportation of explosives; and (2) reviewing and verifying the candidate's practical field experience deemed necessary to qualify a person to accept the responsibility for blasting operations in surface coal mining operations. Such experience should demonstrate that the candidate possesses practical knowledge of blasting techniques, understands the hazards involved in the use of explosives, and otherwise has exhibited a pattern of conduct consistent with the acceptance of responsibility for blasting operations. OSM recognizes that some States have existing licensing agencies and the rule assumes that the regulatory authority responsibility for administration and licensing could be delegated within the existing administrative framework.

Specific topics to be included in any examination are covered in detail in proposed § 850.14(b). Comments are

requested as to whether the list of topics is inadequate or is too extensive.

Certification Requirements

Proposed § 850.15(a) would require the regulatory authority to certify, for fixed periods, candidates who are found qualified as blasters. The fixed periods may vary from State-to-State.

Proposed § 850.15(b) would provide procedures for suspension and revocation of blasters' certifications. Paragraph (c) of § 850.15 would provide general conditions for maintaining certification and may be expanded when implementing the State Program requirements. Some of the features of Paragraphs (b) and (c) are currently set forth in existing § 850.14(e) and (f).

Program Requirements

Proposed § 850.16 would require any program to ensure that (1) the blast is to be fired only under the direction of a certified blaster, (2) no person is to be permitted to detonate explosives unless another person is present, and (3) persons responsible for blasting operations at a blasting site are to be familiar with the blasting plan and site-specific performance standards to be attained.

Comments are requested as to whether all the proposed procedures and conditions of §§ 850.15 and 850.16 should be part of OSM rules or should be left to the responsible regulatory authority.

IV. Procedural Matters

The Department of the Interior (DOI) has examined these proposed rules according to the criteria of Executive Order 12291 (February 17, 1981). OSM has determined that these are not major rules and do not require a regulatory impact analysis because they will impose only minor costs on the coal industry and coal consumers.

The DOI has also determined, pursuant to the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, that these rules will not have significant economic impacts on a substantial number of small entities. As compared with existing rules, the proposal would allow States and small coal operators increased flexibility in respectively setting and meeting performance standards and should especially ease the regulatory burden on small coal operators in Appalachia.

OSM will request approval from the Office of Management and Budget (OMB) under 44 U.S.C. 3507 for the information collection requirements in Part 850. This approval will be codified under a new Section 10 in Part 850 when the final rules are promulgated.

The information required by 30 CFR Part 850 will be used by the regulatory authority in monitoring the implementation of the blaster training and certification programs.

OSM has previously determined that the blaster training and certification programs did not require the preparation of an environmental impact statement under the National Environmental Policy Act, 42 U.S.C. 4321 *et seq.* (NEPA). (See 45 FR 82084, December 12, 1980.) In addition, OSM has prepared a draft environmental assessment (EA) on this proposed rule and has made an interim finding that it would not significantly affect the quality of the human environment. The draft EA is on file in the OSM Administrative Record at the address listed in the "Addresses" section of this preamble. A final EA will be completed and a final conclusion reached on the significance of any resulting impacts before issuance of the final rule. OSM also is preparing an EA of the cumulative impacts on the human environment of this rulemaking and related rulemakings under the Act. This cumulative EA also will be completed before this rule is made final.

Accordingly, it is proposed that 30 CFR Part 850 be revised, as set forth herein.

Dated: February 26, 1982.

William P. Pendley,

Acting Assistant Secretary, Energy and Minerals.

Subchapter M is revised to read as follows:

SUBCHAPTER M—TRAINING, EXAMINATION, AND CERTIFICATION OF BLASTERS

PART 850—PERMANENT REGULATORY PROGRAM REQUIREMENTS

Sec.

850.1 Scope.

850.5 Definition.

850.11 Applicability.

850.12 Responsibility.

850.13 Training.

850.14 Examination.

850.15 Certification.

850.16 Program requirements.

Authority: Pub. L. 95-87, 91 Stat. 445 *et seq.*, 30 U.S.C. 1201 *et seq.*

§ 850.1 Scope.

This part establishes the requirements and the procedures applicable to the development of regulatory programs for training and certification of persons engaging in or directly responsible for the use of explosives for blasting in surface coal mining operations.

§ 850.5 Definition.

As used in this part—

Blaster means a person engaging in or directly responsible for the use of explosives for blasting in surface coal mining operations.

§ 850.11 Applicability.

These rules shall apply to regulatory authorities responsible for implementing and enforcing a permanent surface coal mining regulatory program under Sections 503, 504, and 523 of the Act.

§ 850.12 Responsibility.

(a) The regulatory authority is responsible for promulgating rules governing the training, examination and certification of blasters in surface coal mining operations. When the regulatory authority is a State, the State shall submit these rules to the Office of Surface Mining Reclamation and Enforcement for approval under 30 CFR Parts 731 and 732.

(b) The regulatory authority must develop and adopt a program to examine and certify all persons who intend to engage in the use of explosives for blasting in a surface coal mining operation within 12 months after approval of a State program or implementation of a Federal program or within 12 months after [publication date of final rule], whichever is later.

All blasters with the responsibility for the use of explosives within a permit area are to be certified under the program within 6 months after its adoption.

§ 850.13 Training.

(a) The regulatory authority shall establish procedures which require that—

(1) Blasters receive training including, but not limited to, the technical aspects of blasting operations and State and Federal laws governing the storage, transportation, and use of explosives; and

(2) Persons who are not certified and who are assigned to a blasting crew or to assist in the use of explosives receive direction and on-the-job training from a certified blaster.

(b) The regulatory authority shall ensure that courses are available to train persons engaged in the use of explosives in surface coal mining operations. The courses shall provide training and discuss practical applications of—

- (1) Handling, transporting, storing, and using explosives for blasting purposes;
- (2) Blast design concepts;
- (3) Field layout of blast patterns;
- (4) Loading boreholes;

- (5) Priming and boosting;
- (6) Tamping and stemming;
- (7) Initiation systems;
- (8) Operation of blasting machines;
- (9) Chemical and physical properties of explosives;
- (10) Preparation of accurate reports, schedules, and blasting logs; and
- (11) Methods to recognize, monitor, and minimize:
 - (i) Hazards and dangers involved in the use of explosives;
 - (ii) Blast vibrations;
 - (iii) Flyrock;
 - (iv) Airblast; and
 - (v) Unanticipated blasting hazards.

§ 850.14 Examination.

(a) The regulatory authority shall examine candidates for blaster certification by reviewing and verifying the—

(1) Competence of persons engaged in the use of explosives in surface coal mining operations through a written examination in technical aspects of blasting and State and Federal laws governing the storage, use and transportation of explosives; and

(2) Practical field experience of the candidates deemed necessary to qualify a person to accept the responsibility for blasting operations in surface coal mining operations. Such experience should demonstrate that the candidate possesses practical knowledge of blasting techniques, understands the hazards involved in the use of explosives, and otherwise has exhibited a pattern of conduct consistent with the acceptance of responsibility for blasting operations.

(b) Applicants for blaster certification shall be examined, at a minimum, in the following topics:

- (1) Explosives, including—
 - (i) Selection of the type of explosive to be used; and
 - (ii) Determination of the properties of explosives which will produce desired results.
- (2) Blast designs, including—
 - (i) Geologic and topographic considerations;
 - (ii) Design of a blast hole;
 - (iii) Pattern design, including—
 - (A) Timing of blast holes; and
 - (iv) Ramp cuts, sinking patterns, and field applications.
 - (3) Loading boreholes, including priming and boosting.
 - (4) Initiation systems, including—
 - (i) Electric blasting caps;
 - (ii) Nonelectric initiation systems; and
 - (iii) Detonating cords.
 - (5) Blasting vibrations, airblast, and flyrock, including—
 - (i) Monitoring techniques; and
 - (ii) Methods to control.

- (6) Secondary blasting applications.
- (7) Current Federal and State rules on the use of explosives.
- (8) Blast records.
- (9) Schedules.
- (10) Preblasting surveys, including—
 - (i) Availability;
 - (ii) Coverage; and
 - (iii) Use of in blast design.
- (11) Blast plan requirements.
- (12) Certification and training.
- (13) Signs, warning signals, and site control.
- (14) Unanticipated hazards, including—
 - (i) Lightning;
 - (ii) Stray currents; and
 - (iii) Radio waves.

§ 850.15 Certification.

(a) *Issuance of certification.* The regulatory authority shall, for a fixed period, certify persons examined and found to be competent and to have the necessary experience to accept responsibility for blasting operations in surface coal mining operations.

(b) *Suspension and revocation.* (1) The regulatory authority, when practicable following written notice and opportunity for a hearing, may suspend or revoke the certification of a blaster during the term

of the certification or take other necessary action for any of the following reasons:

- (i) Noncompliance with any order of the regulatory authority.
- (ii) Unlawful use in the work place of, or current addiction to, alcohol, narcotics or other dangerous drugs.
- (iii) Violation of any provision of the State or Federal explosives laws or regulations.
- (iv) Proof that false information was willfully given or a misrepresentation was willfully made to obtain the certification.
- (v) Other good cause.

(2) If advance notice and opportunity for hearing cannot be provided, an opportunity for a hearing will be provided as soon as practical following the suspension, revocation, or other adverse action.

(c) *Conditions.* The regulatory authority shall specify conditions for maintaining certification which, at a minimum, include the following:

(1) A valid certificate or license shall be carried by the holder during all blasting operations.

(2) Certified blasters shall take every reasonable precaution to protect their certificate from loss, theft, or

unauthorized duplication. Any such occurrence must be reported immediately to the certifying authority.

(3) A blaster shall immediately exhibit his certificate to any duly authorized representative of the regulatory authority upon request.

(4) Upon notice of the revocation of any blaster's certification, the former holder of such certification shall immediately surrender to the regulatory authority the revoked certificate.

(5) Blasters' certifications shall not be assigned or transferred.

(6) Blasters shall not delegate their responsibility to any individual who is not a certified blaster.

§ 850.16 Program requirements.

(a) The blast shall be fired only under the direction of a certified blaster.

(b) No person shall be permitted to detonate explosives unless another person is present.

(c) Persons responsible for blasting operations at a blasting site shall be familiar with the blasting plan and site-specific performance standards to be attained.

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