

## SUPPORTING STATEMENT

### Final Rule: Coal Mine Dust Sampling Devices

#### Mandatory Health Standards—Coal Mine Dust Sampling Devices 30 C.F.R. Part 74

The following provisions are addressed in the final rule.

1. § 74.7 Design and construction requirements.
2. § 74.8 Measurement, accuracy, and reliability requirements.
3. § 74.11 Tests of the Continuous Personal Dust Monitor.
4. § 74.13 Applications.
5. § 74.16 Material required for record.

#### A. JUSTIFICATION

- 1. Explain the circumstances that make the collection of information necessary. Identify any legal or administrative requirements that necessitate the collection. Attach a copy of the appropriate section of each statute and regulation mandating or authorizing the collection of information.**

The final rule revises requirements MSHA and NIOSH use to approve sampling devices that monitor miner exposure to respirable coal mine dust. The final rule updates approval requirements for the existing “coal mine dust personal sampler unit” (CMDPSU) to reflect improvements in this sampler over the past 15 years. The final rule also establishes criteria for approval of the “continuous personal dust monitor” (CPDM), a new type of technology that provides real-time sampling results directly to miners during the shift. This rulemaking is limited to approval requirements and does not address requirements concerning how sampling devices must be used to determine compliance, e.g., who and when to sample. A copy of the provisions of the final rule that involve information collection is attached.

- 2. Indicate how, by whom, and for what purpose the information is to be used. Except for a new collection, indicate the actual use the agency has made of the information received from the current collection.**

MSHA and NIOSH will use the information sent by the applicant to determine whether an approval should be given for the CPDM. Joint approval of the CPDM by MSHA and NIOSH will allow its use in underground coal mines for compliance sampling after implementing regulations have been promulgated.

- 3. Describe whether, and to what extent, the collection of information involves the use of automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submission of responses, and the basis for the decision for adopting this means of collection. Also describe any consideration of using information technology to reduce burden.**

MSHA accepts approval applications, correspondence and information electronically via the Internet or e-mail. Approval applicants are able to upload engineering drawings (images) and files directly to the Arlington FTP (File Transfer Protocol) site server or via the IPSO@dol.gov e-mail account. Applicants have been electronically submitting applications to MSHA since 2000.

- 4. Describe efforts to identify duplication. Show specifically why any similar information already available cannot be used or modified for use for the purposes described in Item 2 above.**

This final rule revises existing requirements for approval of coal mine dust sampling devices designed to determine the concentrations of respirable dust in coal mine atmospheres. The final rule establishes criteria for approval of a new type of technology, the “CPDM,” which is worn by the miner and reports exposure to respirable coal dust levels continuously during the shift. In addition, the final rule updates application requirements for the existing “coal mine dust personal sampler unit” to reflect voluntary improvements in this sampler that have been made over the past 15 years.

The applications, consisting of complete scale drawings, specifications, and a description of materials, are unique to each application for approval. Therefore, any similar information already available cannot be used to evaluate and approve CPDMs for use in underground coal mine operations.

- 5. If the collection of information impacts small businesses or other small entities (Item 5 of OMB Form 83-I), describe any methods used to minimize burden.**

The final rule will not have a significant impact on a substantial number of small entities.

- 6. Describe the consequence to Federal program or policy activities if the collection is not conducted or is conducted less frequently, as well as any technical or legal obstacles to reducing burden.**

Before CPDMs can be introduced in coal mines, they must be approved for use by MSHA and NIOSH. The existing regulations limit approval to dust sampling devices of the current design and do not permit the Agencies to approve other technologically advanced sampling devices that are capable of monitoring dust concentrations on a real-time and continuous basis.

MSHA and NIOSH have developed new procedures that would allow manufacturers to apply for approval of the new CPDM technology. This final rule requires manufacturers to demonstrate that devices using continuous monitoring technology are durable and can withstand the mine environment; can be worn by miners performing normal tasks for an entire work shift; provide accurate and precise measurements; and can be safely used in mine atmospheres where explosive mixtures of gases may occur.

This revision to the approval regulations is an important initial step to permit the introduction of the new continuous monitoring technology in coal mines. The use of real-time monitoring devices in the future would allow mine management to take immediate action to prevent miner overexposure and thereby reduce occupational lung disease. If the information collection is not conducted or is conducted less frequently, the Agency may not adequately protect the

health of our nation's miners which is required by the Federal Mine Safety and Health Act of 1977.

**7. Explain any special circumstances that would cause an information collection to be conducted in a manner:**

- **requiring respondents to report information to the agency more often than quarterly;**
- **requiring respondents to prepare a written response to a collection of information in fewer than 30 days after receipt of it;**
- **requiring respondents to submit more than an original and two copies of any document;**
- **requiring respondents to retain records, other than health, medical, government contract, grant-in-aid, or tax records for more than three years;**
- **in connection with a statistical survey, that is not designed to produce valid and reliable results that can be generalized to the universe of study;**
- **requiring the use of a statistical data classification that has not been reviewed and approved by OMB;**
- **that includes a pledge of confidentiality that is not supported by authority established in statute or regulation, that is not supported by disclosure and data security policies that are consistent with the pledge, or which unnecessarily impedes sharing of data with other agencies for compatible confidential use; or**
- **requiring respondents to submit proprietary trade secret, or other confidential information unless the agency can demonstrate that it has instituted procedures to protect the information's confidentiality to the extent permitted by law.**

This collection of information is consistent with the guidelines in 5 C.F.R. § 1320.5.

**8. If applicable, provide a copy and identify the data and page number of publication in the Federal Register of the agency's notice, required by 5 CFR 1320.8(d), soliciting comments on the information collection prior to submission to OMB. Summarize public comments received in response to that notice and describe actions taken by the agency in response to these comments. Specifically address comments received on cost and hour burden.**

**Describe efforts to consult with persons outside the agency to obtain their views on the availability of data, frequency of collection, the clarity of instructions and recordkeeping, disclosure, or reporting format (if any), and on the data elements to be recorded, disclosed, or reported.**

**Consultation with representatives of those from whom information is to be obtained or those who must compile records should occur at least once every 3 years – even if the collection of information activity is the same as in prior periods. There may be circumstances that may preclude consultation in a specific situation. These circumstances should be explained.**

MSHA did not receive any comments on the information collection requirements.

**9. Explain any decision to provide any payment or gift to respondents, other than remuneration of contractors or grantees.**

MSHA has provided no payments or gifts to the respondents identified in this collection.

**10. Describe any assurance of confidentiality provided to respondents and the basis for the assurance in statute, regulation, or agency policy.**

There is no assurance of confidentiality provided to respondents.

**11. Provide additional justification for any questions of a sensitive nature, such as sexual behavior and attitudes, religious beliefs, and other matters that are commonly considered private. This justification should include the reasons why the agency considers the questions necessary, the specific uses to be made of the information, the explanation to be given to persons from whom the information is requested, and any steps to be taken to obtain their consent.**

There are no questions of a sensitive nature.

**12. Provide estimates of the hour burden of the collection of information. The statement should:**

- **Indicate the number of respondents, frequency of response, annual hour burden, and an explanation of how the burden was estimated. Unless directed to do so, agencies should not conduct special surveys to obtain information on which to base hour burden estimates. Consultation with a sample (fewer than 10) of potential respondents is desirable. If the hour burden on respondents is expected to vary widely because of differences in activity, size, or complexity, show the range of estimated hour burden, and explain the reasons for the variance. Generally, estimates should not include burden hours for customary and usual business practices.**
- **If this request for approval covers more than one form, provide separate hour burden estimates for each form and aggregate the hour burdens in Item 13 of OMB Form 83-I.**
- **Provide estimates of annualized cost to respondents for the hour burdens for collections of information, identifying and using appropriate wage rate categories. The cost of contracting out or paying outside parties for information collection activities should not be included here. Instead, this cost should be included in Item 13.**

Final § 74.13(b) requires that a written application for approval be submitted in duplicate to MSHA and NIOSH. MSHA estimates that it takes an engineer, earning \$74.32 per hour, a total of 40 hours to prepare and compile the materials needed to accompany an application. MSHA estimates that it takes a clerical employee, earning \$26.37 per hour, 0.25 hours (15 minutes) to copy and send an application. MSHA calculated hourly wages using data from InfoMine USA, Inc. Table 1 shows 41 burden hours and related costs of approximately \$3,000, in the first year, to prepare the application.

**Table 1: First Year Burden Hours and Costs  
to Prepare Application**

| (a)               | (b)                                | (c)                                    | (d)                                     | (e)   | (f)                                     | (g)                       | (h)                                 | (i)                                 |
|-------------------|------------------------------------|--|---|---|---|---------------------------|-------------------------------------|-------------------------------------|
| No. of Applicants | Time to Compile Material (in hrs.) | Time to Copy & Send Material (in hrs.) | No. of Applications Filed per Applicant | Burden Hours to Compile Materials for Application | Burden Hours to Copy and Send Materials | Engineer Hourly Wage Rate | Clerical Employees Hourly Wage Rate | First Year Burden Cost <sup>a</sup> |
| 1                 | 40                                 | 0.25                                   | 4                                       | 40  | 1                                       | \$74.32                   | \$26.37                             | \$2,999                             |

<sup>a</sup> First Year Costs = (col. e x col. g) + (col. f x col. h).

**13. Provide an estimate of the total annual cost burden to respondents or record keepers resulting from the collection of information. (Do not include the cost of any hour burden shown in Items 12 and 14).**

- **The cost estimate should be split into two components: (a) a total capital and start-up cost component (annualized over its expected useful life); and (b) a total operation and maintenance and purchase of services component. The estimates should take into account costs associated with generating, maintaining, and disclosing or providing the information. Include descriptions of methods used to estimate major cost factors including system and technology acquisition, expected useful life of capital equipment, the discount rate(s), and the time period over which costs will be incurred. Capital and start-up costs include, among other items, preparations for collecting information such as purchasing computers and software; monitoring, sampling, drilling and testing equipment; and record storage facilities.**
- **If cost estimates are expected to vary widely, agencies should present ranges of cost burdens and explain the reasons for the variance. The cost of purchasing or contracting out information collection services should be a part of this cost burden estimate. In developing cost burden estimates, agencies may consult with a sample of respondents (fewer than 10), utilize the 60-day pre-OMB submission public comment process and use existing economic or regulatory impact analysis associated with the rulemaking containing the information collection, as appropriate.**
- **Generally, estimates should not include purchases of equipment or services, or portions thereof, made: (1) prior to October 1, 1995, (2) to achieve regulatory compliance with requirements not associated with the information collection, (3) for reasons other than to provide information or keep records for the government, or (4) as part of customary and usual business or private practices.**

Final §§ 74.7 and 74.8 require tests that the applicant must have performed by a third party. These tests are for: ergonomic design (under final § 74.7(b)); environmental conditions (under final § 74.7(e)); electromagnetic interference (under final § 74.7(f)); flow stability and calibration of pump (under final § 74.7(j)); and accuracy testing, which includes reliability measurement, precision, and bias testing (under final §§ 74.8(c), (d), and (e)). MSHA estimates that it costs approximately \$250,000 to perform these tests. MSHA's estimate of the costs to perform these tests was based on the cost of the tests provided by MSHA's Coal Mine

Safety and Health Division.

Final § 74.11 requires that the applicant submit the CPDM to MSHA for testing and evaluation, under 30 C.F.R. § 18.68, to determine whether the electronic components of the CPDM submitted for approval meet the applicable permissibility requirements. The following tests would be performed by MSHA under § 18.68(a)(1): current limiting resistor adequacy test; coal dust thermal ignition test; optical isolator test; impact test and force test of encapsulated electrical assemblies; drop testing intrinsically safe apparatus; mechanical test of partitions; piezoelectric device impact test; and dielectric strength test. The battery flash current test would be performed under §§ 18.68(a)(1) and (b)(1). The methane thermal ignition test would be performed under §§ 18.68(a)(1) and (b)(6). The maximum surface temperature test would be performed under § 18.68(a)(1) and (b)(3). The spark ignition test would be performed under §§ 18.68(a)(1), (a)(2), (a)(4), (a)(5), (b)(4), and (b)(5).

MSHA estimates that it will take an average of 45 hours to evaluate and 40 hours to test each application. MSHA charges an hourly fee of \$84 per hour for evaluation and testing time. In addition, MSHA applies a support factor of 1.617 to its evaluation time. The support factor covers costs related to MSHA’s administrative, clerical and technical support services in evaluating an application sent to MSHA. Table 2 shows that the estimated first year cost for MSHA to perform evaluation and testing on the application is approximately \$9,500.

**Table 2: First Year Costs for MSHA Evaluation and Testing**

| (a)               | (b)                           | (c)                        | (d)         | (e)            | (f)                          |
|-------------------|-------------------------------|----------------------------|-------------|----------------|------------------------------|
| No. of Applicants | Time for Evaluation (in hrs.) | Time for Testing (in hrs.) | Hourly Rate | Support Factor | First Year Cost <sup>a</sup> |
| 1                 | 45                            | 40                         | 84          | 1.617          | \$9,472                      |

<sup>a</sup> First Year Cost = col. a x [(col. b x col. d x col. e) + (col. c x col. d)].

Final § 74.13(b) requires that a written application for approval be submitted to MSHA and NIOSH in duplicate. Four copies would need to be made (2 copies for MSHA and 2 copies for NIOSH). Table 3, shows that the estimated first year costs to submit the applications are \$170.

**Table 3: Burden Cost to Copy and Submit Applications**

| (a)               | (b)   | (c)                          | (d)                | (e)                          | (f)                          |
|-------------------|---|------------------------------|--------------------|------------------------------|------------------------------|
| No. of Applicants | No. of Applications Submitted per Applicant | No. of pages per Application | Copy Cost per page | Postage Cost per Application | First Year Cost <sup>a</sup> |
| 1                 | 4   | 250                          | \$0.15             | \$5                          | \$170                        |

<sup>a</sup> First Year Cost = col. a x col. b x [(col. c x col. d) + col. e].

Final § 74.16(a) requires that MSHA and NIOSH each retain one CPDM that is submitted with the application. In addition, final § 74.16(b) requires that NIOSH receive one commercially produced CPDM free of charge, if it is approved by NIOSH and MSHA. MSHA estimates that the cost of a CPDM could range between \$8,000 and \$12,000 (for an average of \$10,000 per device). The cost to provide two CPDMs with the application and one subsequent to the approval of the application is estimated to be \$30,000.

The total costs for question 13 are approximately \$289,600.

- 14. Provide estimates of annualized cost to the Federal government. Also, provide a description of the method used to estimate cost, which should include quantification of hours, operational expenses (such as equipment, overhead, printing, and support staff), and any other expense that would not have been incurred without this collection of information. Agencies also may aggregate cost estimates from Items 12, 13, and 14 in a single table.**

There are no Federal costs associated with this collection of information package.

- 15. Explain the reasons for any program changes or adjustments reporting in Items 13 or 14 of the OMB Form 83-I.**

The burden hours apply to one manufacturer. MSHA estimates that in the first year that the final rule is in effect there would be 41 burden hours, \$289,600 of burden costs, and 4 responses (one applicant has to file one application and three duplicates).

- 16. For collections of information whose results will be published, outline plans for tabulation, and publication. Address any complex analytical techniques that will be used. Provide the time schedule for the entire project, including beginning and ending dates of the collection of information, completion of report, publication dates, and other actions.**

MSHA does not intend to publish the results of this information collection.

- 17. If seeking approval to not display the expiration date for OMB approval of the information collection, explain the reasons that display would be inappropriate.**

MSHA is not seeking approval to not display the expiration date for OMB approval of this information collection.

- 18. Explain each exception to the certification statement identified in Item 19, "Certification for Paperwork Reduction Act Submission," of OMB 83-I.**

There are no certification exceptions identified with this information collection.

## **B. COLLECTION OF INFORMATION EMPLOYING STATISTICAL METHODS**

The agency should be prepared to justify its decision not to use statistical methods in any case where such methods might reduce burden or improve accuracy of results. When Item 17 on the Form OMB 83-I is checked "Yes", the following documentation should be included in the Supporting Statement to the extent that it applies to the methods proposed:

1. Describe (including a numerical estimate) the potential respondent universe and any sampling or other respondent selection methods to be used. Data on the number of entities (e.g., establishments, State and local government units, households, or persons) in the universe covered by the collection and in the corresponding sample are to be provided in tabular form for the universe as a whole and for each of the strata in the proposed sample. Indicate expected response rates for the collection as a whole. If the collection had been conducted previously, include the actual response rate achieved during the last collection.
2. Describe the procedures for the collection of information including:
  - Statistical methodology for stratification and sample selection,
  - Estimation procedure,
  - Degree of accuracy needed for the purpose described in the justification,
  - Unusual problems requiring specialized sampling procedures, and
  - Any use of periodic (less frequently than annual) data collection cycles to reduce burden.
3. Describe methods to maximize response rates and to deal with issues of non-response. The accuracy and reliability of information collected must be shown to be adequate for intended uses. For collections based on sampling, a special justification must be provided for any collection that will not yield "reliable" data that can be generalized to the universe studied.
4. Describe any tests of procedures or methods to be undertaken. Testing is encouraged as an effective means of refining collections of information to minimize burden and improve utility. Tests must be approved if they call for answers to identical questions from 10 or more respondents. A proposed test or set of tests may be submitted for approval separately or in combination with the main collection of information.
5. Provide the name and telephone number of individuals consulted on statistical aspects of the design and the name of the agency unit, contractor(s), grantee(s), or other person(s) who will actually collect and/or analyze the information for the agency.

The collection of this information does not employ statistical methods.

## PART 74 – COAL MINE DUST SAMPLING DEVICES

## SUBPART C – REQUIREMENTS FOR CONTINUOUS PERSONAL DUST MONITORS

§ 74.7 Design and construction requirements.

(a) General requirement. Continuous Personal Dust Monitors (CPDMs) shall be designed and constructed for coal miners to wear and operate without impeding their ability to perform their work safely and effectively, and shall be sufficiently durable to perform reliably in the normal working conditions of coal mines.

(b) Ergonomic design testing. Prior to submitting an application under § 74.13, the applicant shall develop a testing protocol and test the CPDM to assure that the device can be worn safely, without discomfort, and without impairing a coal miner in the performance of duties throughout a full work shift. The results of the test shall also demonstrate that the device will operate consistently throughout a full work shift under representative working conditions of underground coal miners, including representative types and durations of physical activity, tasks, and changes in body orientation.

(1) The testing protocol shall specify that the tests be conducted in one or more active mines under routine operating conditions during production shifts.

(2) The applicant shall submit the testing protocol, in writing, to NIOSH for approval prior to conducting such testing.

(3) The applicant shall include the testing protocol and written test results in the application submitted to NIOSH as specified in § 74.13.

(4) NIOSH will advise and assist the applicant, as necessary, to develop a testing protocol and arrange for the conduct of testing specified in this paragraph.

(5) NIOSH may further inspect the device or conduct such tests as it deems necessary to assure the safety, comfort, practicality, and operability of the device when it is worn by coal miners in the performance of their duties.

(6) NIOSH may waive the requirement for the applicant to conduct testing under paragraph (b) of this section if NIOSH determines that such testing is unnecessary to assure the safety, comfort, practicality, and operability of the device when it is worn by coal miners in the performance of their duties.

(c) Maximum weight. A CPDM shall not add more than 2 kg to the total weight carried by the miner. CPDMs that are combined with other functions, such as communication or illumination, may exceed 2 kg provided that the total added weight carried by the miner does not exceed 2 kg.

(d) Dust concentration range. The CPDM shall measure respirable coal mine dust concentrations accurately, as specified under § 74.8, for an end-of-shift average measurement, for concentrations within a range from 0.2 to 4.0 mg/m<sup>3</sup> for respirable

coal mine dust. For end-of-shift average concentrations exceeding 4.0 mg/m<sup>3</sup>, the CPDM shall provide a reliable indication that the concentration exceeded 4.0 mg/m<sup>3</sup>.

(e) Environmental conditions. The CPDM shall operate reliably and accurately as specified under § 74.8, under the following environmental conditions:

(1) At any ambient temperature and varying temperatures from minus 30 to plus 40 degrees centigrade;

(2) At any atmospheric pressure from 700 to 1000 millibars;

(3) At any ambient humidity from 10 to 100 percent relative humidity; and

(4) While exposed to water mists generated for dust suppression and while monitoring atmospheres including such water mists.

(f) Electromagnetic interference. The CPDM shall meet the following standards for control of and protection from electromagnetic interference.

(1) For emissions control, operators must follow: IEEE Std C95.1-2005, (IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz) and 47 CFR 15.1 through 15.407 (FCC Radio Frequency Devices). Persons must proceed in accordance with IEEE Std C95.1-2005 (IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300

GHz). The Director of the Federal Register approves this incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Persons may obtain a copy from:

American National Standards Institute (ANSI)  
25 West 43<sup>rd</sup> Street  
New York, NY 10036  
<http://www.ansi.org>

Persons may inspect a copy at MSHA, Office of Standards, Regulations, and Variances, 1100 Wilson Boulevard, Room 2350, Arlington, Virginia 22209-3939, (202) 693-9440, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to:

[http://www.archives.gov/federal\\_register/  
code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html)

(2) For immunity/susceptibility protection, operators must follow: IEC 61000-4-6, International Standard (Electromagnetic compatibility - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields), Edition 3.0, 2008-10. Persons must proceed in accordance with IEC 61000-4-6, International Standard (Electromagnetic compatibility - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency

fields), Edition 3.0, 2008-10. The Director of the Federal Register approves this incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Persons may obtain a copy from the International Electrotechnical Commission at the address provided below.

International Electrotechnical Commission

IEC Central Office

3, rue de Varembé

P.O. Box 131

CH-1211 GENEVA 20

Switzerland

<http://www.standardsinfo.net>

Persons may inspect a copy at MSHA, Office of Standards, Regulations, and Variances, 1100 Wilson Boulevard, Room 2350, Arlington, Virginia 22209-3939, (202) 693-9440, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to:

[http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html)

(g) Durability testing. The CPDM shall be designed and constructed to remain safe and measure respirable coal mine dust concentrations accurately, as specified under § 74.8 of this

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section after undergoing the following durability tests, which NIOSH will apply to test devices prior to their use in further testing under § 74.8 of this-subpart:

|           |  |  |   |
|-----------|--|--|---|
| Vibration | Mil-Std-810F, 514.5                    | US Highway Vibration, Restrained Figure 514.5C-1 | 1 Hours/Axis, 3 Axis; Total Duration = 3 Hrs, equivalent to 1,000 miles |
| Drop      | 3-foot drop onto bare concrete surface | In standard in-use configuration.                | 1 drop per axis (3 total)   |

Persons must proceed in accordance with Mil-Std-810F, 514.5, Department of Defense Test Method for Environmental Engineering Considerations and Laboratory Tests, 1 January 2000. The Director of the Federal Register approves this incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Persons may obtain a copy from the U.S. Department of Defense at the address provided below.

ASC/ENOI

Bldg. 560, 2530 Loop Road West

Wright-Patterson AFB OH 45433-7101

<http://www.dtc.army.mil/navigator/>

Persons may inspect a copy at MSHA, Office of Standards, Regulations, and Variances, 1100 Wilson Boulevard, Room 2350,

Arlington, Virginia 22209-3939, (202) 693-9440, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to:

[http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html)

(h) Reporting of monitoring results.

(1) The CPDM shall report continuous monitoring results legibly or audibly during use. A digital display, if used, shall be illuminated and shall provide a minimum character height of 6 millimeters. Other forms of display (e.g., analogue) must provide comparable visibility. Auditory reporting, if used, shall be clear, have adjustable volume, and provide means for the user to obtain data reports repetitively. The CPDM shall also report end-of-shift results using computer software compatible with current, commonly used personal computer technology.

(2) The CPDM shall report results as cumulative mass concentration in units of mass per volume of air ( $\text{mg}/\text{m}^3$ ) with two significant figures of accuracy rounded as customary.

(i) Power requirements.

The power source of the CPDM shall have sufficient capacity to enable continuous sampling for 12 hours in a coal mine dust atmosphere of up to  $4.0 \text{ mg}/\text{m}^3$ . If the CPDM uses a rechargeable

battery, the battery charger shall be operated from a 110 (VAC) (nominal), 60 Hz power line.-

(j) Flow stability and calibration of pump. If a pump is used, the flow shall not vary more than  $\pm 5$  percent of the calibrated flow for 95 percent of samples taken for any continuous duration for up to 12 hours. The flow calibration maintenance interval to assure such performance shall be specified in the calibration instructions for the device.

(k) Battery check. If the CPDM uses a rechargeable battery, the CPDM shall have a feature to indicate to the user that the device is sufficiently charged to operate and provide accurate measurements for an entire shift of 12 hours under normal conditions of use.

(l) Integration with other personal mining equipment.

(1) If the CPDM is integrated or shares functions with any other devices used in mines, such as cap lights or power sources, then the applicant shall obtain approvals for such other devices, prior to receiving final certification of the CPDM under this section.

(2) A CPDM that is integrated with another device shall be tested, according to all the requirements under this part, with the other device coupled to the CPDM and operating.

(m) Tampering safeguards or indicators. The CPDM shall include a safeguard or indicator which either prevents intentional or inadvertent altering of the measuring or reporting functions or indicates that the measuring or reporting functions have been altered.

(n) Maintenance features. The CPDM shall be designed to assure that the device can be cleaned and maintained to perform accurately and reliably for the duration of its service life.

§ 74.8 Measurement, accuracy, and reliability requirements.

(a) Breathing zone measurement requirement. The CPDM shall be capable of measuring respirable dust within the personal breathing zone of the miner whose exposure is being monitored.

(b) Accuracy. The ability of a CPDM to determine the true concentration of respirable coal mine dust at the end of a shift shall be established through testing that demonstrates the following:

(1) For full-shift measurements of 8 hours or more, a 95 percent confidence that the recorded measurements are within  $\pm 25$  percent of the true respirable dust concentration, as determined by CMDPSU reference measurements, over a concentration range from 0.2 to 4.0 mg/m<sup>3</sup>; and

(2) For intra-shift measurements of less than 8 hours, a 95 percent confidence that the recorded measurements are within  $\pm 25$

percent of the true respirable dust concentration, as determined by CMDPSU reference measurements, over the concentration range equivalent to 0.2 to 4.0 mg/m<sup>3</sup> for an 8-hour period.<sup>1</sup>

(c) Reliability of measurements. The CPDM shall meet the accuracy requirements under paragraph (b) of this section, regardless of the variation in density, composition, size distribution of respirable coal mine dust particles, and the presence of water spray mist in coal mines.

(d) Precision. The precision of the CPDM shall be established through testing to determine the variability of multiple measurements of the same dust concentration, as defined by the relative standard deviation of the distribution of measurements. The relative standard deviation shall be less than 0.1275 without bias for both full-shift measurements of 8 hours or more, and for intra-shift measurements of less than 8 hours within the dust concentration range equivalent to 0.2 to 4.0 mg/m<sup>3</sup> for an 8-hour period, as specified under paragraph (b)(2) of this section.

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<sup>1</sup> The equivalent dust concentration range to the 8-hour range of 0.2 - 4 mg/m<sup>3</sup> is calculated by multiplying this 8-hour range by the dividend of eight hours divided by the duration of the intrashift measurement specified in units of hours. For example, for a measurement taken at exactly one hour into the shift, the 8-hour equivalent dust concentration range would be a one-hour average concentration range of: 8 hours/1 hour x (0.2 - 4 mg/m<sup>3</sup>) = 1.6 - 32 mg/m<sup>3</sup>; for a two-hour measurement, the applicable concentration range would be calculated as: 8 hours/2 hours x (0.2 - 4 mg/m<sup>3</sup>) = 0.8 - 16 mg/m<sup>3</sup>; for a 4-hours measurement, the equivalent range would be: 0.4 - 8 mg/m<sup>3</sup>; ... etc. A CPDM must perform accurately, as specified, for intrashift measurements within such equivalent concentration ranges.

(e) Bias. The bias of the CPDM measurements shall be limited such that the uncorrectable discrepancy between the mean of the distribution of measurements and the true dust concentration being measured during testing shall be no greater than 10 percent. Bias must be constant over the range of dust concentration levels tested, 0.2 to 4.0 mg/m<sup>3</sup> for an 8-hour sampling period.

(f) Testing conditions. Laboratory and mine testing of the CPDM for accuracy, precision, bias, and reliability under diverse environmental conditions (as defined under § 74.7(e) and (g)) shall be determined using the NIOSH testing procedure, "Continuous Personal Dust Monitor Accuracy Testing," June 23, 2008, available at:

<http://www.cdc.gov/niosh/mining/pubs/pubreference/outputid3076.htm>

. All testing results shall be submitted to NIOSH in writing on the application filed under § 74.11.

Persons must proceed in accordance with NIOSH testing procedure "Continuous Personal Dust Monitor Accuracy Testing," June 23, 2008. The Director of the Federal Register approves this incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Persons may obtain a copy at the address below:

NIOSH-Publications Dissemination  
4676 Columbia Parkway  
Cincinnati, OH 45226

<http://www.cdc.gov/niosh/mining>

Persons may inspect a copy at MSHA, Office of Standards, Regulations, and Variances, 1100 Wilson Boulevard, Room 2350, Arlington, Virginia 22209-3939, (202) 693-9440, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to:

[http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html).

§ 74.11 Tests of the continuous personal dust monitor.

(a) Applicant testing. The applicant shall conduct tests to determine whether a CPDM that is submitted for approval under these regulations meets the requirements specified in §§ 74.7-74.8 of this part, with the exception of durability testing, which shall be conducted by NIOSH as specified in § 74.7(g) of this part. Applicant testing shall be performed by an independent testing entity approved by NIOSH.

(b) NIOSH testing assistance. NIOSH will provide consultation to the applicant to identify and secure necessary testing services for meeting the requirements specified in §§ 74.7-74.8 of this part. Applicants must submit testing protocols to NIOSH prior to testing to verify that the testing protocols adequately address the requirements.

(c) Reporting of applicant testing results. The applicant

shall include the results from testing specified under paragraph (a) of this section when submitting the application under § 74.13 of this part to NIOSH.

(d) Intrinsic safety testing. The applicant shall submit the CPDM to MSHA for testing and evaluation, pursuant to 30 CFR 18.68, to determine whether the electronic components of the CPDM submitted for approval meet the applicable permissibility provisions.

SUBPART D – GENERAL REQUIREMENTS FOR ALL DEVICES

§ 74.13 Applications.

(a) Testing of a CMDPSU will be performed by NIOSH, and testing of the pump unit of the CMDPSU will be conducted by MSHA. The applicant must submit a written application in duplicate to both NIOSH and MSHA. Each copy of the application must be accompanied by complete scale drawings, specifications, and a description of materials. Ten complete CMDPSUs must be submitted to NIOSH with the application, and one pump unit must be submitted to MSHA.

(b) Testing of a CPDM will be performed by the applicant as specified under § 74.11. The applicant must submit a written application in duplicate to both NIOSH and MSHA. Each copy of the application must be accompanied by complete scale drawings, specifications, a description of materials, and a copy of the testing protocol and test results which were provided by an

independent testing entity, as specified in § 74.11(a). Three complete CPDM units must be sent to NIOSH with the application, and one CPDM device must be sent to MSHA.

(c) Complete drawings and specifications accompanying each copy of the application shall be fully detailed to identify the design of the CMDPSU or pump unit thereof or of the CPDM and to disclose the dimensions and materials of all component parts.

§ 74.16 Material required for record.

(a) As part of the permanent record of the approval application process, NIOSH will retain a complete CMDPSU or CPDM, as appropriate, and MSHA will retain a CMDPSU or CPDM, as appropriate, that has been tested and certified. Material not required for record purposes will be returned to the applicant at the applicant's request and expense upon receipt of written shipping instructions by MSHA or NIOSH.

(b) As soon as a CMDPSU or CPDM, as appropriate, is commercially available, the applicant shall deliver a complete sampling device free of charge to NIOSH at the address specified on the NIOSH Web page: <http://www.cdc.gov/niosh/mining>.