DEPARTMENT OF LABOR

Occupational Safety and Health Administration

29 CFR Parts 1904, 1910, 1915, and 1926

[OSHA–2012–0007]

RIN 1218–AC67

Standards Improvement Project—Phase IV

AGENCY: Occupational Safety and Health Administration (OSHA), Labor.

ACTION: Final rule.

SUMMARY: In response to the President's Executive Order 13563, ''Improving Regulations and Regulatory Review,'' and consistent with Executive Order 13777, ''Enforcing the Regulatory Reform Agenda,'' OSHA is removing or revising outdated, duplicative, unnecessary, and inconsistent requirements in its safety and health standards. The current review, the fourth in this ongoing effort, the Standards Improvement Project-Phase IV (SIP–IV), reduces regulatory burden while maintaining or enhancing worker safety and health, and improving privacy protections.

DATES: This rule is effective on July 15, 2019. The incorporation by reference of certain publications listed in the rule is approved by the Director of the Federal Register as of July 15, 2019. There are a number of collections of information contained in this final rule (see Section VI, Paperwork Reduction Act). Notwithstanding the general date of applicability that applies to all other requirements contained in the final rule, affected parties do not have to comply with the collections of information until the Department of Labor publishes a separate notice in the **Federal Register** announcing the Office of Management and Budget has approved them under the Paperwork Reduction Act.

ADDRESSES: In accordance with 28 U.S.C. 2112(a)(2), the agency designates Edmund C. Baird, Associate Solicitor of Labor for Occupational Safety and Health, Office of the Solicitor, Room S–4004, U.S. Department of Labor, 200 Constitution Avenue NW, Washington, DC 20210, to receive petitions for review of the final rule.

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Copies of this ***Federal Register*** *document.* Electronic copies are available at *www.regulations.gov.* This **Federal Register** document, as well as news releases and other relevant information, also are available at OSHA's web page at *www.osha.gov.*

SUPPLEMENTARY INFORMATION:

Incorporated Standards

The standards published by the American Thoracic Society (ATS) required in 29 CFR part 1910, subpart Z; the Federal Highway Administration (FHWA) required in 29 CFR part 1926, subpart G; the International Labour Organization (ILO) required in 29 CFR part 1910, subpart Z, 29 CFR part 1915, subpart Z, and 29 CFR part 1926, subpart Z; the International Organization for Standardization (ISO) required in 29 CFR part 1926, subpart W; and the Society of Automotive Engineers (SAE) required in 29 CFR part 1926, subpart W, are incorporated by reference into these subparts with the approval of the **Federal Register** under 5 U.S.C. 552(a) and 1 CFR part 51.

Reasonable Availability and Summary of the Incorporated Standards

American Thoracic Society—IBR Approval for §§ 1910.6 and 1910.1043(h)

The American Thoracic Society (ATS) provides free online public access to view and print a read-only copy of the materials incorporated into 29 CFR part 1910, subpart Z, by this rulemaking. Free online viewing and a printable version of Spirometric Reference Values from a Sample of the General U.S. Population. Hankinson JL, Odencrantz JR, Fedan KB. American Journal of Respiratory and Critical Care Medicine, 159:179–187, 1999, is available at *www.atsjournals.org/.*

Section 1910.1043(h)(2)(iii) required that health care providers conducting medical surveillance compare the employee's actual values to the predicted values in appendix C of the standard. NIOSH (CDC/NIOSH, 2003), ATS/ERS (Pellegrino et al., 2005), and ACOEM (Townsend, 2011) all recommend the Third National Health and Nutrition Examination Survey (NHANES III) as the most appropriate reference data set for assessing spirometry results for individuals in the U.S. population. OSHA is now revising this provision to specify use of the NHANES III reference data set and to replace the values currently in appendix C with the NHANES III values, derived from Spirometric Reference Values from a Sample of the General U.S. Population (Hankinson et al., 1999).

The NHANES III data set is the most recent and most representative of the U.S. population (Hankinson et al., 1999). It lists reference values for non-smoking, asymptomatic male and female Caucasians, African Americans, and Mexican Americans aged 8- to 80-years old. Strict adherence to ATS quality control standards ensured optimal accuracy in developing this data set of spirometry values (Hankinson et al., 1999).

Federal Highway Administration—IBR Approval for §§ 1926.200(g)(2) and 1926.201(a)

The Federal Highway Administration (FHWA), United States Department of Transportation provides free online access to view and print a read-only copy of the materials incorporated into 29 CFR part 1926, subpart G, by this rulemaking. Free online viewing and a printable version of the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), 2009 Edition, December 2009 (including Revision 1 dated May 2012 and Revision 2 dated May 2012), is available at *www.fhwa.dot.gov.*

Subpart G has required that employers comply with Part VI of MUTCD, 1988 Edition, Revision 3, September 3, 1993 (''1988 Edition'') or December 2000 MUTCD (''Millennium Edition''). OSHA is revising subpart G to update the incorporation by reference of Part 6 of the MUTCD to the November 4, 2009 MUTCD (''2009 Edition''), including Revision 1 and Revision 2, both dated May 2012. This version of the MUTCD aims to expedite traffic, promote uniformity, improve safety, and incorporate technology advances in traffic control device application (74 FR 66730, 77 FR 28455, and 77 FR 28460).

International Labour Organization—IBR Approval for § 1910.6, Appendix E to § 1910.1001, § 1915.5, Appendix E to § 1915.1001, § 1926.6, and Appendix E to § 1926.1101

The International Labour Organization (ILO) provides free online access to view and print a read-only copy of the materials incorporated into 29 CFR part 1910, subpart Z, 29 CFR part 1915, subpart Z, and 29 CFR part 1926, subpart Z, by this rulemaking. Free online viewing and a printable version of the Guidelines for the Use of the ILO International Classification of Radiographs of Pneumoconioses, Revised Edition 2011, Occupational safety and health series; 22 (Rev.2011), is available at *www.ilo.org.*

Digital radiography systems are rapidly replacing traditional analog film-based systems in medical facilities, and both the ILO and the National Institute for Occupational Safety and Health (NIOSH) recently published guidelines for digital radiographs (see 81 FR at 68509). OSHA is updating the version of the Guidelines for the Use of ILO Classification of Radiographs of Pneumoconioses to the 2011 version (from the 1980 version), and clarifying that classification must be in accordance with the ILO classification system (rather than ''a professionally accepted Classification system'') in appendix E of each of the three asbestos standards (81 FR at 68510).

The International Organization for Standardization and the Society of Automotive Engineers—IBR Approval for Subpart W

The International Organization for Standardization (ISO) provides for purchase materials incorporated into 29 CFR part 1926, subpart W, by this rulemaking. ISO 3471:2008(E), Earth-moving machinery—Roll-over protective structures—Laboratory tests and performance requirements, Fourth Edition, Aug. 8, 2008; ISO 5700:2013(E), Tractors for agriculture and forestry—Roll-over protective structures—Static test method and acceptance conditions, Fifth Edition, May 1, 2013; and ISO 27850:2013(E), Tractors for agriculture and forestry—Falling object protective structures—Test procedures and performance requirements, First Edition, May 01, 2013, are available for purchase at *www.iso.org.*

The Society of Automotive Engineers (SAE) provides for purchase materials incorporated into 29 CFR part 1926, subpart W, by this rulemaking. SAE J167, Protective Frame with Overhead Protection-Test Procedures and Performance Requirements, approved July 1970; SAE J168, Protective Enclosures-Test Procedures and Performance Requirements, approved July 1970; SAE J320a, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired, Self-Propelled Scrapers, revised July 1969 (editorial change July 1970); SAE J334a, Protective Frame Test Procedures and Performance Requirements, revised July 1970; SAE J394, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired Front End Loaders and Rubber-Tired Dozers, approved July 1969 (editorial change July 1970); SAE J395, Minimum Performance Criteria for Roll-Over Protective Structure for Crawler Tractors and Crawler-Type Loaders, approved July 1969 (editorial change July 1970); SAE J396, Minimum Performance Criteria for Roll-Over Protective Structure for Motor Graders, approved July 1969; and SAE J397, Critical Zone—Characteristics and Dimensions for Operators of Construction and Industrial Machinery, approved July 1969, are available for purchase at *www.sae.org/standards.*

The original source standards for subpart W requirements were derived from SAE Standards. The American National Standards Institute (ANSI) and SAE subsequently canceled these standards. To design and develop new equipment, the industry now uses the most recent ISO standards. Equipment manufactured after the effective date of this final rule must meet the applicable test and performance requirements for the ISO standards. Equipment manufactured before the effective date of this final rule must meet the former SAE requirements of subpart W, or the test and performance requirements for the applicable ISO standards that apply to newly manufactured equipment.

ISO 3471:2008(E), Earth-moving machinery—Roll-over protective structures—Laboratory tests and performance requirements, Fourth Edition, Aug. 8, 2008 (''ISO 3471:2008''), IBR approved for §§ 1926.1001(c) and 1926.1002(c), specifies performance requirements for metallic roll-over protective structures (ROPS) for earth-moving machinery, as well as a consistent and reproducible means of evaluating the compliance with these requirements by laboratory testing using static loading on a representative specimen.

ISO 5700:2013(E), Tractors for agriculture and forestry—Roll-over protective structures—Static test method and acceptance conditions, Fifth Edition, May 1, 2013 (''ISO 5700:2013''), IBR approved for § 1926.1002(c), specifies a static test method and the acceptance conditions for roll-over protective structures (cab or frame) of wheeled or tracked tractors for agriculture and forestry.

ISO 27850:2013(E), Tractors for agriculture and forestry—Falling object protective structures—Test procedures and performance requirements, First Edition, May 01, 2013 (''ISO 27850:2013''), IBR approved for § 1926.1003(c), sets forth the test procedures and performance requirements for a falling object protective structure, in the event such a structure is installed on an agricultural or forestry tractor.

SAE J167, Protective Frame with Overhead Protection—Test Procedures and Performance Requirements, approved July 1970, IBR approved for § 1926.1003(b), establishes requirements of a frame including overhead cover for the protection of operators on wheel type agricultural and industrial tractors to minimize the possibility of operator injury resulting from accidental upsets and overhead hazards during normal operation.

SAE J168, Protective Enclosures—Test Procedures and Performance Requirements, approved July 1970, IBR approved for § 1926.1002(b), specifies test procedures and performance requirements for wheel type agricultural and industrial tractors equipped with protective enclosures necessary to fulfill the intended purposes.

SAE J320a, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired, Self-Propelled Scrapers, revised July 1969 (editorial change July 1970), IBR approved for § 1926.1001(b), provides the testing agency with a means of testing for structural adequacy of a roll-over protective structure (ROPS) design.

SAE J334a, Protective Frame Test Procedures and Performance Requirements, revised July 1970, IBR approved for § 1926.1002(b), establishes requirements of a frame for the protection of operators on wheel type agricultural and industrial tractors to minimize the possibility of operator injury resulting from accidental upsets during normal operation.

SAE J394, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired Front End Loaders and Rubber-Tired Dozers, approved July 1969 (editorial change July 1970) IBR approved for 1926.1001(b), provides the testing agency with a means of testing for structural adequacy of a roll-over protective structure (ROPS) design.

SAE J395, Minimum Performance Criteria for Roll-Over Protective Structure for Crawler Tractors and Crawler-Type Loaders, approved July 1969 (editorial change July 1970), IBR approved for § 1926.1001(b), provides the testing agency with a means of testing for structural adequacy of a roll-over protective structure (ROPS) design.

SAE J396, Minimum Performance Criteria for Roll-Over Protective Structure for Motor Graders, approved July 1969 (editorial change July 1970), IBR approved for § 1926.1001(b), provides the testing agency with a means of testing for structural adequacy of a roll-over protective structure (ROPS) design.

SAE J397, Critical Zone—Characteristics and Dimensions for Operators of Construction and Industrial Machinery, approved July 1969, IBR approved for § 1926.1001(b), covers

characteristics and dimensions of a critical zone to prevent crushing of an operator during roll-over.

Dates of Approval and Further Availability

The incorporation by reference of materials from the ATS, ILO, FHWA, and ISO is approved by the Director of the Federal Register as of July 15, 2019. The incorporation by reference of the various SAE standards in 29 CFR part 1926, subpart W, was approved by the Director of the Federal Register before January 6, 2015.

All approved material is available for inspection at the OSHA Docket Office (U.S. Department of Labor, 200 Constitution Avenue NW, Room N–3508, Washington DC 20210; telephone 202–693–2350) and is available from the sources listed in 29 CFR 1910.6, 29 CFR 1915.5, and 29 CFR 1926.6. The material is also available for inspection 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 *www.archives.gov/federal-register/cfr/ibr-locations.html.*

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I. Executive Summary

OSHA is making 14 revisions to existing standards in the recordkeeping, general industry, maritime, and construction standards. The purpose of the Standards Improvement Project (SIP) is to remove or revise outdated, duplicative, unnecessary, and inconsistent requirements in OSHA's safety and health standards, which will permit better compliance by employers and reduce costs and paperwork burdens where possible, without reducing employee protections. In fact, many of the revisions in this rulemaking reduce costs while improving worker safety and health or privacy. OSHA is conducting SIP–IV in response to the President's Executive Order 13563, ''Improving Regulations and Regulatory Review'' (76 FR 3821), and consistent with Executive Order 13777, ''Enforcing the Regulatory Reform Agenda'' (82 FR 12285). The revisions include an update to the consensus standard incorporated by reference for signs and devices used to protect workers near automobile traffic, a revision to the requirements for roll-over protective structures to comply with current consensus standards, updates for storage of digital x-rays, and the method of calling emergency services to allow for use of current technology. OSHA is also revising two standards to align with current medical practice: A reduction to the number of necessary employee x-rays and updates to requirements for pulmonary function testing. To protect employee privacy and prevent identity fraud, OSHA is also removing from the standards the requirements that employers include an employee's social security number (SSN) on exposure monitoring, medical surveillance, and other records.

SIP rulemakings are reasonably necessary under the Occupational Safety and Health Act of 1970 (OSH Act; 29 U.S.C. 651 et al.) to provide cost savings, or eliminate unnecessary requirements. The agency estimates cost savings and paperwork reductions for SIP rulemakings. The agency estimates that one revision (updating the method of identifying and calling emergency medical services) may increase construction employers' combined costs by about $32,000 per year while two provisions (reduction in the number of necessary employee x-rays and elimination of posting requirements for residential construction employers) provide estimated combined cost savings of $6.1 million annually. This final rule is considered an Executive Order (E.O.) 13771 deregulatory action. Details on OSHA's cost/cost savings estimates for this final rule can be found in the rule's Final Economic Analysis and Final Regulatory Flexibility Act Analysis in this preamble. OSHA has estimated that, at a discount rate of 3 percent over 10 years, 7 percent over 10 years, or 7 percent over a perpetual time horizon, this final rule yields net annual cost savings of $6.1 million per year.

The agency has not estimated or quantified benefits to employees from reduced exposure to x-ray radiation or to employers for the reduced cost of storing digital x-rays rather than x-ray films. The agency has concluded that the revisions are economically feasible and do not have any significant economic impact on small businesses. The Final Economic Analysis in this preamble provides an explanation of the economic effects of the revisions.

II. Background

The purpose of the SIP–IV rulemaking is to remove or revise outdated, duplicative, unnecessary, and inconsistent requirements in OSHA's safety and health standards. The agency believes that improving OSHA standards will increase employers' understanding of their obligations, which will lead to increased compliance, improved employee safety and health, and reduced compliance costs.

In 1995, in response to a Presidential memorandum to improve government regulation,[1] OSHA began a series of rulemakings designed to revise or remove standards that were confusing, outdated, duplicative, or inconsistent. OSHA published the first rulemaking, ''Standards Improvement Project, Phase I'' (SIP–I) on June 18, 1998 (63 FR 33450).[2] Two additional rounds of SIP rulemaking followed, with final SIP rules published in 2005 (SIP–II) (70 FR 1111) and 2011 (SIP–III) (76 FR 33590).[3]

As stated above, the President's Executive Order 13563 (E.O.), ''Improving Regulations and Regulatory Review,'' establishes the goals and criteria for regulatory review, and requires agencies to review existing standards and regulations to ensure that these standards and regulations continue to protect public health, welfare, and safety effectively, while promoting economic growth and job creation. The E.O. encourages agencies to use the best, least burdensome means to achieve regulatory objectives, to perform periodic reviews of existing standards to identify outmoded, ineffective, or burdensome standards,

[1] Clinton, W.J., Memorandum for Heads of Departments and Agencies. Subject: Regulatory Reinvention Initiative. March 4, 1995.

[2] Revisions made by the SIP–I rulemaking included adjustments to the medical-surveillance and emergency-response provisions of the Coke Oven Emissions, Inorganic Arsenic, and Vinyl Chloride standards, and removal of unnecessary provisions from the Temporary Labor Camps standard and the textile industry standards.

[3] In the final SIP–II rule published in 2005 (70 FR 1111), OSHA revised a number of provisions in its health and safety standards identified as needing improvement either by the Agency or by commenters during the SIP–I rulemaking. These included updating or removing notification requirements from several standards, updating requirements for first aid kits to reflect newer consensus standards, updating requirements for laboratories analyzing samples under the vinyl chloride standard, and making worker exposure monitoring frequencies consistent under certain health standards, among other things. The final SIP–III rule, published in 2011 (76 FR 33590), updated consensus standards incorporated by reference in several OSHA rules, deleted provisions in a number of OSHA standards that required employers to prepare and maintain written training-certification records for personal protective equipment, revised several sanitation standards to permit hand drying by high-velocity dryers, and modified OSHA's sling standards to require that employers use only appropriately marked or tagged slings for lifting capacities.

and to modify, streamline, or repeal such standards when appropriate. The agency believes that the SIP rulemaking process is an effective means to improve its standards.

OSHA advised the Advisory Committee for Construction Safety and Health (ACCSH) at a public meeting held on December 16, 2011, that it intended to review its standards under the SIP criteria, with particular emphasis on construction standards. A transcription of these proceedings (ACCSH Transcript) is available at Docket No. OSHA–2011–0124–0026.

Recognizing the importance of public participation in the SIP process, the agency published a Request for Information (RFI) on December 6, 2012 (77 FR 72781), asking the public to identify standards that were in need of revision or removal, and to explain how such action would reduce regulatory burden while maintaining or increasing the protection afforded to employees. The agency received 26 comments in response to the RFI. Several of the revisions in this rule were recommended in the public comments received in response to the RFI. Other revisions were identified by the agency's own internal review and by ACCSH.

On October 4, 2016, OSHA published a Notice of Proposed Rulemaking (NPRM) titled ''Standards Improvement Project—Phase IV'' (81 FR 68504). The period for submitting comments was originally 60 days and was extended by 30 days to allow parties affected by the rule more time to review the proposed rule and collect information and data necessary for comments. The comment period ended on January 4, 2017.[4]

OSHA received around 700 submissions on the proposed rulemaking, with many of the submissions containing comments on more than one of the proposed revisions. The proposed revision to the shipyards standard to remove ''feral cats'' from the definition of ''vermin'' received over 500 comments in support. The proposed revision to the lockout/tagout standard in general industry received about 150 comments against and seven in favor. The remaining comments cover the other proposed revisions. All significant issues raised in the comments are discussed in the Summary and Explanation of the Final Rule.

OSHA is moving forward with 14 revisions in its recordkeeping, general industry, maritime, and construction standards. OSHA is not moving forward with proposed revisions to the lockout/tagout general industry standard, personal protective equipment fit in construction, the excavation construction standard, or the decompression tables in the underground construction standard. OSHA received requests for a hearing on the proposal regarding the lockout/tagout standard from some commenters that were opposed to that proposal. In light of the information provided by the comments, OSHA is not in a position at this time to make a final decision on this issue. As a result, the agency will further consider this issue in light of the overall standard. As OSHA is not moving forward with the proposed changes to the lockout/tagout standard, the agency determined that a hearing was not required. OSHA describes the revisions, including changes from the proposal and decisions not to move forward on four proposals, in detail in section III, Summary and Explanation of the Final Rule.

III. Summary and Explanation of the Final Rule

A. Revision in Occupational Injuries and Illnesses Recording and Reporting Standards (29 CFR Part 1904)

Subpart C—Recording Forms and Recording Criteria, Recording Criteria for Cases Involving Occupational Hearing Loss in 29 CFR 1904.10

OSHA proposed to revise § 1904.10(b)(6) of the Recordkeeping rule with language that will assist employers to comply with requirements for recording hearing loss. Title 29 CFR 1904.5 applies to the determination criteria for work-relatedness of all occupational injuries and illnesses, including hearing loss. OSHA proposed adding a cross-reference to this section to clarify requirements for physicians or other licensed health care professionals (PLHCPs) when making a determination of work-relatedness for cases of hearing loss. The final rule is identical to the proposal.

The addition of the cross-reference simply emphasizes the pre-existing requirement that, if an event or exposure in the work environment either caused or contributed to the hearing loss, or significantly aggravated a pre-existing hearing loss, the PLHCP, just as anybody else evaluating a case involving hearing loss, must consider the case to be work-related. Ultimately, the employer is responsible for ensuring that the PLHCP applies the analysis in § 1904.5 when evaluating work-related hearing loss, if the employer chooses to rely on the PLHCP's opinion in determining recordability.

Commenters who opposed the addition of this cross-reference at § 1904.10(b)(6) represented employers in manufacturing and construction sectors. These commenters stated that if OSHA intended for § 1904.5, specifically the presumption of work-relatedness, to apply to occupational hearing loss cases, the rulemaking to revise the hearing loss provisions in the rule on recording and reporting occupational injuries and illnesses in 2002 should have contained this explicitly (Occupational Injury and Illness Recording and Reporting Requirements, 67 FR 44037 (July 1, 2002)). (See discussion of specific comments below.) However, OSHA notes that the existing regulatory text of § 1904.10(b)(5) already confirms this where it states, ''You must use the rules in § 1904.5 to determine if the hearing loss is work-related.'' The addition of the new cross-reference is merely to reduce any existing confusion. OSHA has received compelling evidence from commenters representing workers' unions and the field of audiology that there is confusion about the interpretation of § 1904.10(b)(6) and what definition of work-relatedness applies. The agency believes that the simple addition of this cross-reference to another existing requirement adds clarity for PHLCPs and employers, and after considering the comments on this proposal, OSHA has decided to add the cross-reference to § 1904.5 in § 1904.10(b)(6).

Several commenters expressed support for OSHA's proposed cross-reference to § 1904.5 in § 1904.10(b)(6). The Laborers' Health & Safety Fund of North America (LHSFNA) and North America's Building Trades Union (NABTU) stated that hearing loss among construction workers is severely underreported (OSHA–2012–0007–0742, –0757). NABTU cited the CPWR Center for Construction Research and Training's Fifth Edition of the Construction Chart Book which suggests that rates of hearing loss in the construction industry are elevated significantly beyond the 1,400 cases that BLS reported from 2004 to 2010:

> Since employers have no obligation to test workers' hearing (audiometric testing) in construction, even if employees experience noise levels at or above OSHA's PEL, hearing loss in construction is rarely recognized as an

[4] The NPRM was also consistent with Executive Order 13777, ''Enforcing the Regulatory Reform Agenda'' (82 FR 12285). That Executive Order requires each agency's Regulatory Reform Task Force to identify regulations for ''repeal, replacement, or modification'' that, among other things, ''eliminate jobs, or inhibit job creation;'' ''are outdated, unnecessary, or ineffective;'' or ''impose costs that exceed benefits.'' *Id.* section 3(d). In OSHA's view, the regulatory provisions identified in the NPRM met those criteria for repeal, replacement, or modification.

occupational disease. It is not surprising, therefore, that the numbers reported to the BLS show a very low rate of hearing loss, and for this reason hearing loss data for construction are not comparable with data for general industry.

(OSHA–2012–0007–0781). The CPWR Chart Book notes that in the 7 years between 2004 and 2010, the BLS reported 1,400 cases of hearing loss in construction. They contrasted this number with hearing data that are collected by the National Health Interview Survey (NHIS), a large household survey in the U.S. In the NHIS Survey, at least one in five (21.4%) construction workers self-reported some hearing trouble in 2010 (chart 49b). The CPWR Chart Book indicates that this is nearly one-third higher than the proportion of workers with hearing trouble for all industries combined (16.3%). Id.

NABTU stated that the addition of the cross-reference would clarify that a PLHCP has the same responsibilities in evaluating whether hearing loss is work-related as in evaluating any other workplace injury or illness. NABTU added that OSHA's proposed revision to § 1904.10 would provide consistency between standards, and that the clarification would serve to improve reporting of work-related hearing loss (OSHA–2012–0007–0742).

The United Steel, Paper and Forestry, Rubber, Manufacturing, Energy, and Allied Industrial and Service Workers International Union (USW) also supported the addition of the cross-reference. USW described a case involving USW members in which a health care professional consistently ruled that cases of hearing loss were not occupational, even though those workers had experienced high workplace noise levels for years. Each case was instead attributed to loud music, firing a gun while hunting, or some other non-occupational cause (OSHA–2012–0007–0764).

The AFL–CIO stated that:

> It appears that many employers are misinterpreting the current language in section 1904.10(b)(6) to allow a physician to use different criteria for determining work-relatedness than are set forth in section 1904.5 of the regulation. This proposal will help to make clear that physicians and other health care professionals must apply the criteria in section 1904.5 of the recordkeeping rule in making determinations whether hearing loss is work-related for the purposes of recording the case on the OSHA 300 log. The recording of such cases will help identify jobs and operations where workers are exposed to excessive levels of noise and assist in efforts to control these exposures to prevent further risk to workers.

(OSHA–2012–0007–0761).

Dr. Alice Suter, Ph.D., provided a link to a position paper from the National Hearing Conservation Association (NHCA), ''NHCA Guidelines on Recording Hearing Loss on the OSHA 300 Log.'' It states:

> Professional reviewers commonly report pressure by their clients to make a determination that an STS [Standard Threshold Shift] is not recordable. Some have been questioned and challenged on every case they have identified as work-related. Others are unsure of their obligations under the OSHA regulations . . . To the extent that STSs are minimized because of reluctance to report them, workers are not getting the necessary counseling, hearing protector checking, and noise control remedies that could prevent further hearing loss.

(OSHA–2012–0007–0767).

In her comments, Dr. Suter stated that (a) the definition of an STS is quite lenient—so any STS is already a significant shift in hearing threshold level; (b) to qualify for recordability, the hearing loss must first exceed a hearing threshold level of 25dB, which is quite a significant level itself; and (c) to be in a hearing conservation program and to have one's hearing tested, workers are, by definition, exposed to levels of 85 dBA or above, where the risk of noise-induced hearing loss is well-known (OSHA–2012–0007–0767).

Several associations representing employer interests in manufacturing and construction industries expressed opposition to this revision. The Construction Industry Safety Coalition (CISC) and the Coalition for Workplace Safety (CWS) believed that the addition of a reference to § 1904.5 at § 1904.10(b)(6) would substantively change the requirements for recording occupational hearing loss cases (OSHA–2012–0007–0753 and –0756). This cross-reference creates no new requirement. In fact, the same cross-reference to § 1904.5 already exists in the language of § 1904.10(b), which is adjacent and immediately prior to § 1904.10(b)(6). Section 1904.10(b)(5) requires the employer to employ the rules of § 1904.5 to ascertain if the hearing loss is work related. The provision also states that the hearing loss must be considered work related if an event or exposure in the work environment either caused or contributed to the hearing loss, or significantly aggravated a pre-existing hearing loss.

The addition of the very same cross-reference in § 1904.10(b)(6) merely ensures consistency between provisions, provides clarity for PLHCPs in the assessment and determination of hearing loss cases, and in no way alters interpretation of the existing regulations under part 1904.

Section 1904.5(a) states that an injury or illness is to be considered work-related if an event or exposure in the work environment either caused or contributed to the resulting condition or significantly aggravated a pre-existing injury or illness. Work-relatedness is presumed for injuries and illnesses resulting from events or exposures occurring in the work environment, unless an exception in § 1904.5(b)(2) specifically applies. Section 1904.5(b)(1) defines the work environment as ''the establishment and other locations where one or more employees are working or are present as a condition of their employment.'' OSHA sometimes refers to this presumption for injuries and illnesses that occur in the work environment to be work-related as the ''geographical presumption.'' In their comments, CISC and CWS noted that in OSHA's 2002 preamble to the revision of § 1904.10, the agency stated:

> OSHA agrees . . . that it is not appropriate to include a presumption of work-relatedness for hearing loss cases to employees who are working in noisy work environments. It is possible for a worker who is exposed at or above the 8-hour 85 dBA action levels of the noise standard to experience a non-work-related hearing loss, and it is also possible for a worker to experience a work-related hearing loss and not be exposed to those levels.

(OSHA–2012–0007–0753 and –0756 (quoting 67 FR 44037, 44045)). This statement was not addressing the geographic presumption of § 1904.5, but a different presumption—that of work-relatedness whenever the employee was exposed to noise of 85 dBA or greater, as in the 2001 revision of § 1904.10(b)(5). The current regulations do not contain a presumption that hearing loss is work-related when the work environment is loud (85 dBA or greater). The clarification to § 1904.10(b)(6) does not, and could not, create such a presumption.

OSHA clarified in the 2002 rulemaking that § 1904.5 is to be followed when making work-relatedness determinations. 67 FR 44037, 44045. The 2001 version of § 1904.10(b)(5) had created a special rule for noise exposure in the workplace, providing that hearing loss is presumed to be work-related if the employee is exposed to noise in the workplace at an 8-hour time-weighted average of 85 dBA or greater, or to a total noise dose of 50 percent, as defined in 29 CFR 1910.95. For hearing loss cases where the employee is not exposed to this level of noise, the rules in § 1904.5 must be used to determine if the hearing loss is work-related.

Occupational Injury and Illness Recording and Reporting Requirements, 66 FR 5916, 6129 (Jan. 19, 2001). But in 2002, OSHA abandoned the special rule and reverted to treating the determination of work-relatedness of hearing loss as it does for any other injury or illness under the recordkeeping rule: ''Therefore, the final rule states that there are *no special rules* for determining work-relationship and restates that *the rule's overall approach to work-relatedness*—that a case is work-related if one or more events or exposures in the work environment either caused or contributed to the hearing loss, or significantly aggravated a pre-existing hearing loss.'' 67 FR at 44045 (emphasis added). The text of § 1904.10(b)(5) confirms this: ''You must use the rules in § 1904.5 to determine if the hearing loss is work-related.''

OSHA maintains that indeed it is not appropriate to include an outright presumption of work-relatedness for hearing loss cases. For example, as stipulated at § 1904.5(b)(2)(ii), if an employee in a high-noise work environment meets the recording criteria for hearing loss, but a physician discovers that the employee has an inner ear infection that is entirely responsible for the loss, the case would not be considered work-related. OSHA has consistently interpreted § 1904.10(b)(6) this way since 2001:

> [T]he provisions allowing for review by a physician or other licensed health care professional allow for the exclusion of hearing loss cases that are not caused by noise exposure, such as off the job traumatic injury to the ear, infections, and the like. OSHA notes that this presumption is consistent with a similar presumption in OSHA's Occupational Noise standard (in both cases, an employer is permitted to rebut this presumption if he or she suspects that the hearing loss shown on an employer's audiogram in fact has a medical etiology and this is confirmed by a physician or other licensed health care professional).

66 FR 5916, 6012. The addition of a cross-reference in § 1904.10(b)(6) adds no new requirement and merely clarifies the existing requirements for PLCHPs, and ultimately employers, in hearing loss case determinations.

The Graphic Arts Coalition (GAC) submitted comments stating that the revision, as proposed, would significantly expand the employer's responsibility for hearing loss that may have just as easily been incurred through workers' off-duty behaviors including the use of ''ear buds'' or headphones, power tools, lawn mowers, chain saws, or attendance at music or sporting events. GAC stated that this revision would negate workers' non-workplace noise exposures, and increase OSHA recordables and enforcement actions unfairly (OSHA–2012–0007–0737).

But for a case to be presumed work-related, there must be a *causal* connection between the injury or illness and an event or exposure at work. This does not mean that work factors must outweigh non-work factors in causing the injury, or that work factors must be quantifiable, *e.g.,* a 10% or 20% cause, or that work factors must be ''significant.'' Causality for OSHA recordkeeping purposes is established if work is a cause. In order to further clarify the issue of work-relatedness, in 2001, OSHA entered into a settlement agreement with the National Association of Manufacturers (NAM) to resolve NAM's challenge to the 2001 recordkeeping final rule. The settlement agreement states that ''a case is presumed work-related if, and only if, an event or exposure in the work environment is a discernable cause of the injury or illness or of a significant aggravation to pre-existing condition. The work event or exposure need only be one of the discernable causes; it need not be the sole or predominant cause.'' Settlement Agreement: Occupational Injury and Illness Recording and Reporting, 66 FR 66943, 66944 (Dec. 27, 2001). As a result, the geographic presumption treats a case as work-related if work is one cause, even if there are also other non-work causes. However, there must be a causal relationship between the injury or illness and a work event; there is no presumption that an injury is work-related simply because it occurs at work (see § 1904.5(b)(2)).

GAC and Formosa Plastics also disagreed specifically with the use of language from Compliance Directive CPL 02–00–135 in the proposed rule preamble, with GAC stating that by incorporating language from a compliance directive into the standard, OSHA would in effect be turning guidance into a requirement (OSHA–2012–0007–0737, –6333). OSHA disagrees. The only revision of the regulatory text is to add the cross-reference to the existing regulatory provision at § 1904.5. OSHA is adding this cross-reference through the use of notice-and-comment rulemaking, in this Standards Improvement Project-IV rulemaking, which is the proper and appropriate way to make changes to the CFR. This cross-reference adds no new requirement for employers, removes ambiguity, and adds clarity to OSHA enforcement policy already currently in place.

The Flexible Packing Association and Bemis Company also submitted comments that emphasized that to enter a hearing conservation program, an employee must be exposed to an 8-hour time-weighted average sound level of 85 dBA or higher (OSHA–2012–0007–0765, –6338). That is correct, under 29 CFR 1910.95(c)(1), and is not being changed by this rulemaking.

The American Petroleum Institute commented that it had no concerns about the proposed cross-reference, but it did have concerns about the language of the compliance directive (OSHA–2012–0007–0766). The only change being made here is the addition of a cross-reference to § 1904.5.

Some organizations that were generally supportive of the cross-reference felt that it could be improved by the addition of further language. The USW suggested that the cross-reference also be included in the occupational noise exposure standard at § 1910.95(g)(8)(ii), as follows: ''. . . unless a physician determines ***in accord with Section 1904.5*** that the standard threshold shift is not work-related or aggravated by occupational noise exposure . . . (bolded italics added)'' (OSHA–2012–0007–0764). While OSHA appreciates that suggestion, OSHA is not making any changes to the occupational noise standard that were not proposed in the SIP–IV NPRM.

NIOSH felt that consistency may not be accomplished by simply cross-referencing to § 1904.5, because § 1904.5 differs in some respects from the compliance directive. It is OSHA's regulations that are enforceable, and OSHA is only adding the cross-reference to the existing regulatory definition of work-relatedness here.

NIOSH also made the distinction that:

> § 1904.5 states that determination of whether work ''significantly aggravated'' a pre-existing illness or injury is made when the work exposure causes one of the following (which would not have occurred simply from the pre-existing condition):
>
> i. Death
> ii. Loss of consciousness
> iii. One or more days away from work, or days of restricted work, or days of job transfer
> iv. Medical treatment or a change in medical treatment.
>
> Occupational noise exposure does not cause i–iv and cross referencing to § 1904.5 may be confusing.

(OSHA–2012–0007–0726). OSHA agrees that § 1904.5(b)(4), which NIOSH cited, is not applicable to hearing loss. However, as explained above, § 1904.10(b)(5) already requires analysis under § 1904.5. OSHA will not be

adding language beyond the cross-reference to the text of § 1904.10(b)(6), and the final text is identical to the proposed text.

B. Revisions in General Industry Standards, Shipyard Standards, and Construction Standards (29 CFR Parts 1910, 1915, and 1926)

1. Subpart Z of Parts 1910, 1915, and 1926—Toxic and Hazardous Substances, Asbestos in 29 CFR 1910.1001, Inorganic Arsenic in 29 CFR 1910.1018, Cadmium in 29 CFR 1910.27, Coke Oven Emissions in 29 CFR 1910.29, Acrylonitrile in 29 CFR 1910.1045, Asbestos in 29 CFR 1915.1001, Asbestos in 29 CFR 1926.1101, Cadmium in 29 CFR 1926.1127.

OSHA proposed three revisions. The first revision was to remove the requirement in several of its standards that employers provide periodic chest X-rays (CXR) to screen for lung cancer. The final rule retains that proposed revision without change. The second revision was to allow employers to use digital radiography and other reasonably-sized standard films for X-rays. The final rule retains that proposed revision without change. The third revision was to update terminology and references to the International Labour Organization (ILO) guidelines included in its asbestos standards (81 FR 68504, 68507–68511). The final rule's language is nearly the same as that originally proposed, but with some minor changes to respond to concerns raised by NIOSH.

Several OSHA standards currently require periodic CXR to screen exposed workers for lung cancer. Since these standards were promulgated, however, large studies with many years of follow-up have not shown a benefit of CXR screening in reducing either lung cancer incidence or mortality (see 81 FR at 68507–68511). As a result, OSHA proposed removing the requirement for periodic CXR in the following standards: 29 CFR 1910.1018, Inorganic Arsenic; § 1910.1029, Coke Oven Emissions; and § 1910.1045, Acrylonitrile. OSHA did not propose to remove the requirement for a baseline CXR in these, or any other, standards, as baseline CXR at pre-placement or at the initiation of a medical surveillance program provides benefits to workers exposed to lung carcinogens, their employers, and healthcare professionals evaluating these workers (see 81 FR at 68509). OSHA also did not propose removing the CXR requirements in standards where CXR is used for purposes other than screening for lung cancer. For example, OSHA is retaining the CXR requirements in the asbestos standards (§§ 1910.1001, 1915.1001, and 1926.1101) to continue screening for asbestosis. OSHA proposed adding the text, ''Pleural plaques and thickening may be observed on chest X-rays'' in the non-mandatory appendix H of the general industry asbestos standard (§ 1910.1001), as well as the parallel appendices in the Maritime and Construction asbestos standards (§ 1915.1001, appendix I; § 1926.1101, appendix I) (see 81 FR at 68564, 68662, 68684).

OSHA also proposed updating the CXR requirements to allow, but not require, the use of digital CXRs, also referred to as digital radiographs, in the medical surveillance provisions of its inorganic arsenic (§ 1910.1018), coke oven emissions (§ 1910.1029), and acrylonitrile (§ 1910.1045) standards discussed above, and its asbestos (§§ 1910.1001, 1915.1001, 1926.1101) and cadmium (§§ 1910.1027 and 1926.1127) standards. Digital radiography systems are rapidly replacing traditional analog film-based systems in medical facilities, and both the ILO and the National Institute for Occupational Safety and Health (NIOSH) recently published guidelines for digital radiographs (see 81 FR at 68509). In addition, OSHA proposed allowing other reasonably-sized standard X-ray films, such as the 16 inch by 17 inch size, to be used in addition to the 14 inch by 17 inch film specified in some standards. This proposed change would affect the acrylonitrile (§ 1910.1045), inorganic arsenic (§ 1910.1018), coke oven emissions (§ 1910.1029), and asbestos (§§ 1910.1001, 1915.1001, and 1926.1101) standards. Updating this requirement, as proposed, would ensure consistency across standards as well as conformance with current medical practice (81 FR at 68510).

Lastly, OSHA proposed replacement of ''roentgenogram'' with ''X-ray'' to reflect current terminology and corrections to remove references to semi-annual exams for certain employees in the coke oven emissions appendices (§ 1910.1029, app. A(VI) and app. B(II)(A)), as these exams were eliminated in the second SIP rulemaking (70 FR 1112). OSHA also proposed making changes to conform to the language used in the ILO's ''Guidelines for the use of the ILO International Classification of Radiographs of Pneumoconioses,'' which refers to a classification system as applying to CXR, while interpretation refers to the information translated by the physician to the employer. The proposed revisions clarified that classification must be in accordance with the ILO classification system (rather than ''a professionally accepted Classification system'') according to the Guidelines for use of the ILO International Classification of Radiographs of Pneumoconioses (revised edition 2011) in appendix E of each of the three asbestos standards (81 FR at 68510).

Comments and Responses on Removing the Requirement To Provide Periodic CXR To Screen for Lung Cancer

OSHA received several comments supporting the proposal to remove the periodic CXR requirement for lung cancer screening from the inorganic arsenic (§ 1910.1018), coke oven emissions (§ 1910.1029), and acrylonitrile (§ 1910.1045) standards. These comments came from organizations representing labor, industry, and NIOSH.

Among labor unions, the Laborers' Health & Safety Fund of North America (LHSFNA) noted, ''Chest X-rays are of very little value in lung cancer cases'' (OSHA–2012–0007–0757). Similarly, the United Steel, Paper and Forestry, Rubber, Manufacturing, Energy, Allied Industrial and Service Workers International Union (USW) stated, ''There is no evidence that ordinary chest x-rays can detect lung cancer in time to affect mortality'' (OSHA–2012–0007–0764). The USW noted that low-dose computed tomography (LDCT), unlike CXR, can detect lung cancer while treatable, but brings with it the risk of increased radiation exposure and false positive results. USW further stated that better equipment and protocols have helped with the latter two problems, and that LDCT will continue to improve (OSHA–2012–0007–0764). The USW recommended that OSHA consider adopting LDCT in the future for high-risk populations (OSHA–2012–0007–0764).

North America's Building Trades Unions (NABTU) agreed with OSHA's proposal to remove the periodic CXR requirement, writing, ''We agree that it is long past time to remove requirements for CXRs for the screening detection of lung cancer, since they have no benefit and offer only harm'' (OSHA–2012–0007–0742). With regard to LDCT, however, NABTU stated that OSHA should replace the CXR requirement with a carefully-monitored LDCT screening requirement:

[W]hile 'OSHA will continue to monitor the literature on [whether to continue to require] baseline Chest X-rays', the agency offers no similar assurance about other forms of screening for lung cancer and, in particular, includes an inadequate assessment of the

benefits of LDCT. After citing a Cochran review that is 3 years old and opining that it may take NIOSH years to come up with recommendations, OSHA effectively absolves employers from any requirement to offer an intervention that has been demonstrated to save lives. This clearly violates the intent of the standards and raises the concern that OSHA intends to wait another 30 years before making needed updates.

(OSHA–2012–0007–0742).

NABTU further stated that OSHA is ''repeating the mistakes that lead to the CXR requirements and this overdue standard improvement'' and should ensure that current medical input is considered in this standard improvement (OSHA–2012–0007–0742). NABTU asserted that LDCT screening for lung cancer has been endorsed by most relevant medical organizations, as prospective studies have demonstrated LDCT to be an effective lung screening method (OSHA–2012–0007–0742). Recognizing the potential for unnecessary biopsies and surgical interventions from LDCT screening, NABTU advocated for LDCT screening only for workers with sufficient smoking history and a history of occupational lung carcinogen exposure (OSHA–2012–0007–0742). NABTU cited the Building Trades National Medical Screening Program (BTMed) as an example, which screens former Department of Energy (DOE) construction workers for lung cancer with LDCT if they meet the following criteria: Age between 50 to 79 years; five years of employment at a DOE site; smoking history of 20 pack-years (number of cigarette packs per day times number of years smoked) or evidence of asbestosis on CXR; and not recently treated for cancer. The findings among 1,300 scanned workers have included 15 Stage 1 lung cancers, two Stage 2 lung cancers, and six Stage 4 lung cancers (OSHA–2012–0007–0742). Based on these data, NABTU urged OSHA to adopt an LDCT screening requirement using the criteria from the BTMed program, and to collaborate with NIOSH and the National Cancer Institute (NCI) to continue to evaluate outcomes and modify LDCT screening requirements (OSHA–2012–0007–0742). NABTU also submitted to the record guidance from the Finnish Institute of Occupational Health (FIOH) and the Lung Cancer Alliance on LDCT screening for asbestos workers (OSHA–2012–0007–0742, Attachments 4 and 5, respectively).

OSHA acknowledges the concerns of NABTU about not replacing the periodic CXR requirement with an appropriate intervention for lung cancer screening. OSHA also appreciates the data shared from the BTMed Program, which appeared to show LDCT as a useful tool for lung cancer detection. However, OSHA believes that the utility of LDCT in occupational lung cancer screening remains a complex issue, as the agency is not aware of any definitive LDCT screening recommendations based upon a large, randomized, controlled study of workers. Instead, the screening recommendations have stemmed from a study of smokers (*i.e.,* the National Lung Screening Trial), as referenced by NABTU (see Aberle, et al., 2011) (OSHA–2012–0007–0742, Attachment 3).

The National Lung Screening Trial enrolled asymptomatic men and women (n=53,454), aged 55 to 74, that were current smokers or former smokers within the last 15 years and had a smoking history of at least 30 pack-years. The participants underwent annual lung cancer screening with either LDCT or chest radiography for three years. The results showed a statistically significant 20 percent relative reduction in lung cancer mortality with LDCT screening (Aberle, et al., 2011) (OSHA–2012–0007–0742, Attachment 3). However, the trial also showed that LDCT screening results in a high false-positive rate; 24.2 percent of the total LDCT screening tests were classified as positive, with 96.4 percent of these positive results ultimately being false positives. In addition, 39.1 percent of the 26,722 (or about 10,450) participants in the LDCT screening group had at least one positive screening result during the study (Aberle, et al., 2011) (OSHA–2012–0007–0742, Attachment 3). Given that only 649 cancers were diagnosed after a positive screening test, and assuming that each of these cancers was in a different participant, it follows that only 6.2 percent of those with at least one positive test were ultimately diagnosed with lung cancer. This means that 36.7 percent of participants in the LDCT screening group had at least one false positive result. Most positive initial screening results in the National Lung Screening Trial—many of which were false positives—were followed up with a diagnostic evaluation that included further imaging and, infrequently, invasive procedures (Aberle, et al., 2011) (OSHA–2012–0007–0742, Attachment 3). The authors noted potentially harmful effects that could result, including overdiagnosis and the development of radiation-induced cancer (Aberle, et al., 2011) (OSHA–2012–0007–0742, Attachment 3).

Based on these findings of the National Lung Screening Trial, the U.S. Preventive Services Task Force (USPSTF), an independent, volunteer panel of national experts in prevention and evidence-based medicine, recommended annual screening for lung cancer with LDCT for adults aged 55 to 80 years with a 30 pack-year smoking history and who either currently smoke or have quit within the past 15 years. Under USPSTF's criteria, screening should be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery (Moyer et al., 2014) (OSHA–2012–0007–0032). However, given the high false positive rate and subsequent imaging and resulting radiation dose in the National Lung Screening Trial, the USPSTF also noted that lung cancer screening with LDCT is not without harm:

> The benefit of screening varies with risk because persons who are at higher risk because of smoking history or other risk factors are more likely to benefit. Screening cannot prevent most lung cancer deaths, and smoking cessation remains essential. Lung cancer screening has substantial harms, most notably the risk for false-positive results and incidental findings that lead to a cascade of testing and treatment that may result in more harms, including the anxiety of living with a lesion that may be cancer. Overdiagnosis of lung cancer and the risks of radiation are real harms, although their magnitude is uncertain. The decision to begin screening should be the result of a thorough discussion of the possible benefits, limitations, and known and uncertain harms (Moyer, et al., 2014).

(OSHA–2012–0007–0032).

In addition to the USPSTF, several other organizations have recommended similar lung cancer screening protocols for high-risk smokers, including the American Cancer Society, American College of Chest Physicians, American Society of Clinical Oncology, American Lung Association, National Comprehensive Cancer Network, and the American Association for Thoracic Surgery. Each organization's specific screening recommendations are summarized by the U.S. Centers for Disease Control and Prevention: *www.cdc.gov/cancer/lung/pdf/guidelines.pdf.*

OSHA is not aware of any definitive recommendations based on a large, randomized, controlled study examining the benefit of lung cancer screening with LDCT among occupationally-exposed workers. NABTU supplied a report by the FIOH that recommended LDCT screening in asbestos-exposed individuals if their personal combination of risk factors yields a risk for lung cancer equal to that needed for entry into the National

Lung Screening Trial (OSHA–2012–0007–0742, Attachment 4). Similarly, as discussed by NABTU, the National Comprehensive Cancer Network (NCCN), a nonprofit alliance of 27 cancer centers, recommended screening for two high risk groups: (1) Current or former smokers within the last 15 years who are ages 55 to 74 years with a smoking history of 30 pack-years or more; or (2) individuals age 50 years or older with a smoking history of at least 20 pack-years and with one or more additional risk factors; these risk factors include a history of chronic obstructive pulmonary disease (COPD) or pulmonary fibrosis, a history of cancer, a family history of lung cancer, radon exposure, or occupational exposure to asbestos, arsenic, beryllium, cadmium, chromium (VI), nickel, silica, or diesel fumes (see *www.cdc.gov/cancer/lung/pdf/guidelines.pdf*). The former criteria are very similar to those recommended by the USPTF for heavy smokers, while the latter criteria are similar to those used in the NABTU BTMed program: Age 50 to 79 years, not recently treated for cancer, with five years of employment at a Department of Energy (DOE) site and either a 20 pack-year smoking history or evidence of asbestosis on CXR (OSHA–2012–0007–0742).

NABTU submitted to the record a study by McKee et al. (2015, OSHA–2012–0007–0742, Attachment 2) in which individuals meeting either NCCN group 1 or group 2 criteria (see above) were offered an LDCT screening scan between January 2012 and December 2013. The authors examined the lung cancer detection outcomes between the two groups, as ''[i]nclusion of the group 2 population into annual lung screening has generated controversy because this group was not formally evaluated in the NLST [National Lung Screening Trial] or other CT lung screening trials'' (OSHA–2012–0007–0742, Attachment 2). Of 1,760 persons scanned (1,296 in group 1 and 464 in group 2), there were 481 positive results (365 in group 1 and 116 in group 2). Follow-up data were available for 1,328 (75%) scanned individuals (997 in group 1 and 331 in group 2) and indicated 23 diagnosed cancers (17 in group 1 and six in group 2). Overall, the group 2 results were substantively similar to the group 1 results, for both the rate of positive results and the annualized cancer detection rates. The authors concluded that screening eligibility should be expanded to include group 2 (McKee et al., 2015) (OSHA–2012–0007–0472, Attachment 2).

While the published results of the McKee et al. study are somewhat encouraging for the potential future use of LDCT, OSHA notes that no information was provided about the false positive rate, subsequent imaging or invasive procedures, and cumulative radiation dose received. The 481 positive results among 1,760 persons screened indicates a total positive rate of 27 percent, the majority of which were likely false positives given the 23 diagnosed cancers among the 1,328 persons with follow-up data. In addition, it is unclear the extent to which persons in Group 2 were occupationally exposed, as only 24% (approximately 129) of the 538 persons in Group 2 were reported to have carcinogen exposure (see Fig. 3, OSHA–2012–0007–0472, Attachment 2). The carcinogen itself or the amount of exposure was not specified, and the majority of persons in Group 2 were instead included in the group based on having a history of a chronic lung disease or smoking-related cancer (see Fig. 3, OSHA–2012–0007–0472, Attachment 2). It is also unclear if any of the six people diagnosed with cancer in Group 2 had exposure to an occupational carcinogen. In addition, lung cancer mortality was not studied. Thus, OSHA maintains that additional research, specifically well-conducted, randomized, controlled studies of occupationally-exposed workers, is needed to establish the efficacy of LDCT screening for lung cancer among workers.

OSHA's position is further supported by the 2014 FIOH report, provided by NABTU (OSHA–2012–0007–0742, Attachment 4), and NIOSH. FIOH reviewed the literature on the efficacy of lung cancer screening with LDCT in asbestos-exposed workers, and concluded that lung cancer screening with LDCT should be considered for those persons with prior exposure to asbestos who are at or above the risk threshold (1.34% over 6 years) set for participation in the National Lung Screening Trial (OSHA–2012–0007–0742, Attachment 4). However, FIOH found that none of the risk calculators they examined showed a risk approaching the National Lung Screening Trial risk threshold for a 50-year-old man with a smoking history of 20 pack-years and occupational exposure to asbestos; the risk threshold was exceeded in one risk model for a 60-year-old man with a smoking history of 10 pack-years, asbestos exposure, and a family history of lung cancer (OSHA–2012–0007–0742, Attachment 4). It should be noted that asbestos exposure was not quantified in these risk calculators, with one model based on data from subjects with a minimum duration of five years of employment in an occupation at high risk for asbestos exposure, and the other model based on data from subjects with at least one year of asbestos exposure (OSHA–2012–0007–0742, Attachment 4). Although FIOH recommended that asbestos-exposed individuals be considered for LDCT lung cancer screening if their personal combination of risk factors, particularly smoking history, yields a risk of lung cancer at or above that needed for entry in the National Lung Screening Trial, FIOH also concluded:

> Much work remains to be done related to risk estimation for lung cancer screening eligibility, especially the interplay between age, smoking history, other exposures to tobacco smoke, and other risk factors such as occupational history or genetic predisposition. Going forward it is imperative that efforts are focused on answering these key questions about lung cancer risk, patient selection, and the benefits and harms of lung cancer screening in asbestos-exposed adults. (OSHA–2012–0007–0742, Attachment 4).

Industry support for the proposal came from the North American Insulation Manufacturers Association (NAIMA), representing the insulation industry (OSHA–2012–0007–0701). NAIMA noted that OSHA's proposal to remove the periodic CXR requirement for lung cancer screening would ''remove costly and burdensome requirements for some'' (OSHA–2012–0007–0701).

NIOSH submitted comments to the record supporting OSHA's proposal to remove the CXR requirement for lung cancer screening (other than an initial, baseline CXR) in various standards, re-affirming that ''current medical literature does not support the effectiveness of screening for lung cancer with periodic CXR'' (OSHA–2012–0007–0726). NIOSH also agreed with OSHA's assessment that existing evidence is insufficient to justify using alternative screening methods to CXR, that it may be years before research can provide a recommendation on the efficacy of LDCT screening, and that further research is needed on the risks associated with LDCT-associated radiation exposure occurring during a screening protocol for workers exposed to lung carcinogens in the workplace (OSHA–2012–0007–0726).

NIOSH encouraged OSHA to track new developments that may eventually justify requirements for lung cancer screening with LDCT in various standards, and pointed to the FIOH recommendations for asbestos-exposed workers, as discussed above (OSHA–2012–0007–0726). NIOSH suggested

that it may, in the future, be possible to conduct lung cancer screening with ultralow-dose computed tomography (CT) with radiation doses similar to conventional CXR (OSHA–2012–0007–0726), pointing to a recent study by Huber et al. (2016) (OSHA–2012–0007–0726, Attachment 3). In this study, the authors examined a lung phantom with multiple nodules of different sizes using both standard CT and ultralow-dose CT, and found that 93.3% of lung nodules were detected with ultralow-dose CT, compared with 95.5% with standard CT (OSHA–2012–0007–0726, Attachment 3). Additional post-processing of imaging improved the detection rate. The authors concluded that lung cancer screening with ultralow-dose CT is feasible, but also acknowledged that the use of a lung phantom was a ''major limitation'' (OSHA–2012–0007–0726, Attachment 3).

NIOSH suggested that OSHA, in potential future requirements for LDCT screening, consider setting different threshold levels of exposure to occupational carcinogens that trigger screening in nonsmokers compared to smokers (OSHA–2012–0007–0726). NIOSH also noted the importance of appropriate counseling in LDCT screening, as results often lead to repeat CT scans to evaluate changes in nodules over time (OSHA–2012–0007–0726).

OSHA agrees with NIOSH and its statements regarding the need for the agency to stay apprised of developments that may eventually justify the use of LDCT or ultralow-dose CT for lung cancer screening in workers. There are currently no definitive LDCT lung cancer screening recommendations based on a randomized, controlled trial of occupationally-exposed workers. Thus, OSHA believes that additional scientific study of lung cancer screening with LDCT for workers is needed. However, for this rulemaking, the currently available evidence on LDCT screening for lung cancer indicates a high rate of false positive results (as observed in the National Lung Screening Trial) that can lead to unnecessary follow-up and potential harms.

After considering these comments, OSHA has decided to delete the requirement for periodic CXR in 29 CFR 1910.1018, Inorganic Arsenic; § 1910.1029, Coke Oven Emissions; and § 1910.1045, Acrylonitrile. OSHA has also decided not to require the use of LDCT or ultralow-dose CT for periodic lung cancer screening in workers at this time.

Comments and Responses on Allowing Employers To Use Digital Radiography and Other Reasonably-Sized Standard Films for CXR

OSHA received many comments supporting the proposal to allow, but not require, the use of digital CXRs in the medical surveillance provisions of the inorganic arsenic (§ 1910.1018), coke oven emissions (§ 1910.1029), acrylonitrile (§ 1910.1045), asbestos (§§ 1910.1001, 1915.1001, 1926.1101), and cadmium (§§ 1910.1027 and 1926.1127) standards, and to allow the use of other reasonably-sized standard X-ray films. Support was received from NAIMA, NIOSH, NABTU, LHSFNA, and USW (OSHA–2012–0007–0701; –0726; –0742, –0757; and –0764). LHSFNA summarized, ''The past few years have brought rapid digitization to the medical industry. The proposed change to allow digital X-ray storage is a necessary consequence of changes in technology'' (OSHA–2012–0007–0757). There were no comments opposing the use of digital CXRs or other reasonably-sized standard X-ray films. After considering these comments, OSHA has decided to allow, but not require, the use of digital CXRs in the medical surveillance provisions of the standards listed.

Comments and Response on Updating Terminology and References to the ILO Guidelines

OSHA also received comments on the proposals to replace ''roentgenogram'' with ''X-ray'' to reflect current terminology, remove references to semi-annual exams for certain employees in the coke oven emissions appendices (§ 1910.1029, app. A(VI) and app. B(II)(A)), update language to refer to classification (not interpretation), consistent with the ILO Guidelines, and update references to the ILO guidelines in appendix E of each of the three asbestos standards. NAIMA expressed support for updating the terminology and references to the ILO guidelines in the asbestos standards (OSHA–2012–0007–0701). NABTU also expressed support for referencing the updated ILO guidelines (OSHA–2012–0007–0742). After considering these comments, OSHA has decided to finalize its proposals to replace ''roentgenogram'' with ''X-ray'' to reflect current terminology, to remove references to semi-annual exams for certain employees in the coke oven emissions appendices (§ 1910.1029, app. A(VI) and app. B(II)(A)), and to refer to only classification.

NIOSH expressed concern that the ILO's 2011 ''Classification of Radiographs of Pneumoconioses'' allows digital CXRs to be printed out as hard copies and then classified using the ILO's standard image films. NIOSH cited research suggesting that allowing this approach will significantly increase the apparent prevalence of small opacities (Franzblau, et al., 2009) (OSHA–2012–0007–0726, Attachment 4). In the proposal, OSHA recommended that radiographic facilities and physicians ''should'' follow the NIOSH Guidelines, ''Application of Digital Radiography for the Detection and Classification of Pneumoconiosis,'' and noted that NIOSH does not recommend using film-based ILO reference radiographs for comparison with digital chest images or printed hard copies of the images (81 FR at 68510). Instead, NIOSH recommended that OSHA require the use of the NIOSH Guidelines, which state that only ILO digital standard images should be used to classify digital CXRs. NIOSH noted that the Department of Labor (DOL) regulations already promulgated by the Office of Workers' Compensation Programs (OWCP) at 20 CFR part 718 are consistent with the NIOSH Guidelines (OSHA–2012–0007–0726).

OSHA has carefully considered this concern and believes that NIOSH has presented compelling evidence, in the research cited and within the OWCP regulation, that digital CXRs should not be printed as a hard copy and then compared to ILO film standard images. As such, OSHA has incorporated the reference to the 2011 ILO guidelines, but has added language reflecting NIOSH's concerns. Specifically, in appendix E to the asbestos standards (§§ 1910.1001, 1915.1001, and 1926.1101), OSHA has added a provision requiring that digitally-acquired chest X-rays be classified using a complete set of ILO standard digital chest radiographic images provided for use with the Guidelines for the Use of the ILO International Classification of Radiographs of Pneumoconioses (revised edition 2011). The classification of digitally-acquired chest X-rays must be performed based on the viewing of images displayed as electronic copies, and not based on the viewing of hard copy printed transparencies of the images. OSHA believes these edits to the regulatory language address NIOSH's concerns and are consistent with the DOL OWCP regulation.

In addition, NIOSH expressed concern that the regulatory language in appendix E of each of the three asbestos standards (§§ 1910.1001, 1915.1001, and 1926.1101) allows CXR classification by a ''B-Reader, a board eligible/certified

radiologist, or an experienced physician with known expertise in pneumoconiosis'' (see 81 CFR at 68563, 68661, and 68683). NIOSH suggested that OSHA either remove the ''experienced physician'' or more specifically define the type of expertise in pneumoconiosis that is required to qualify as an ''experienced physician'' and that would ensure such a physician is able to accurately classify CXRs using the ILO classification system (OSHA–2012–0007–0726). OSHA recognizes NIOSH's concern, and notes that in the new respirable crystalline silica standard, only B-Readers can classify x-rays. See 29 CFR 1910.1053(i)(2)(iii). However, this change to the asbestos standards was not proposed. OSHA will consider making this change in a future rulemaking.

Summary of Changes

As proposed, OSHA is removing the requirement for periodic CXR in the following standards: 29 CFR 1910.1018, Inorganic Arsenic; § 1910.1029, Coke Oven Emissions; and § 1910.1045, Acrylonitrile. OSHA is not removing the requirement for a baseline CXR in these, or any other, standards. OSHA is also not removing the CXR requirements in standards where CXR is used for purposes other than screening for lung cancer; for example, OSHA is retaining the CXR requirements in the asbestos standards (§§ 1910.1001, 1915.1001, and 1926.1101) to continue screening for asbestosis. OSHA is adding the text, ''Pleural plaques and thickening may be observed on chest X-rays'' in the non-mandatory appendix H of the general industry asbestos standard (§ 1910.1001), as well as appendix I of the maritime and construction asbestos standards (§§ 1915.1001 and 1926.1101, respectively).

OSHA is also updating the CXR requirements to allow, but not require, the use of digital CXRs in the medical surveillance provisions of the inorganic arsenic (§ 1910.1018), coke oven emissions (§ 1910.1029), and acrylonitrile (§ 1910.1045) standards, and the asbestos (§§ 1910.1001, 1915.1001, 1926.1101) and cadmium (§§ 1910.1027 and 1926.1127) standards. In addition, OSHA is allowing other reasonably-sized standard X-ray films, such as the 16 inch by 17 inch size, to be used in addition to the 14 inch by 17 inch film specified in some standards.

Finally, OSHA is replacing ''roentgenogram'' with ''X-ray'' to reflect current terminology and is also eliminating references to semi-annual exams for certain employees in the coke oven emissions appendices (§ 1910.1029, app. A(VI) and app. B(II)(A)), as these exams were eliminated in the second SIP rulemaking (70 FR 1112). In appendix E of each of its three asbestos standards, OSHA is updating terminology and clarifying that classification must be in accordance with the ILO classification system according to the Guidelines for the use of the ILO International Classification of Radiographs of Pneumoconioses (revised edition 2011). OSHA is also further specifying that only ILO standard digital chest radiographic images are to be used to classify digital CXRs, and that digital CXRs are not to be printed out as hard copies and then classified.

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2. Subpart Z of Part 1910—Toxic and Hazardous Substances, Cotton Dust in 29 CFR 1910.1043

OSHA proposed to update the lung-function testing requirements of its cotton-dust standard to align them with current practices and technology. The language of the final rule is slightly changed from that originally proposed in response to comments from NIOSH.

In 1978, OSHA promulgated the standard for occupational exposure to cotton dust at 29 CFR 1910.1043 because workers exposed to cotton dust are at risk of developing the respiratory disease byssinosis (43 FR 27350, June 23, 1978). As described in the preambles to the proposed and final rules, as well as in the preamble to the SIP–IV NPRM, byssinosis is characterized by a continuum of effects (41 FR 56497, 56500–56501, December 28, 1976; 43 FR 27352–27354; 81 FR 68511). The cotton dust standard contains medical-surveillance provisions at 29 CFR 1910.1043(h). These provisions require initial and periodic medical-surveillance examinations that include administration of a medical questionnaire to determine if workers are experiencing symptoms (§ 1910.1043(h)(2)(ii) and (h)(3)(i)). Medical surveillance requirements also include pulmonary function testing (*i.e.,* spirometry testing) to objectively measure lung function and to assess changes in lung function (§ 1910.1043(h)(2)(iii)).

To improve the accuracy and consistency of pulmonary function testing, OSHA mandated specific requirements in the cotton dust standard based on recommendations from the American Thoracic Society (ATS) and the National Institute for Occupational Safety and Health (NIOSH) (43 FR 27391; 29 CFR 1910.1043, appendix D). Since 1978, pulmonary function testing procedures and technology have evolved significantly, and some of the mandates in the cotton dust standard now are outdated. OSHA thus proposed in the SIP–IV NPRM (81 FR 68504) to update the lung function testing requirements for the cotton dust standard to align them with current practices and technology. Three commenters supported OSHA's proposed updates to requirements for pulmonary function testing in the cotton dust standard (NIOSH, OSHA–2012–007–0726; NABTU, OSHA–2012–0007–0742; and Change to Win, OSHA–2012–0007–0759). No comments opposed to these proposed changes were submitted to the rulemaking record. After considering these comments, OSHA has decided to issue this final rule codifying these updates.

Proposed and Final Revisions

OSHA based the proposed revisions to the cotton dust standard pulmonary

function testing requirements on current recommendations from the American Thoracic Society/European Respiratory Society (ATS/ERS), NIOSH, and the American College of Occupational and Environmental Medicine (ACOEM). Each of these organizations is a recognized authority on generally accepted practices in pulmonary function testing. As in the proposal, references to generally accepted practices in this final rule refer to only those practices recommended by ATS/ERS, NIOSH, or ACOEM.

Like other respiratory diseases, byssinosis can slow the speed of expired air and/or reduce the volume of air that can be inspired and then exhaled. To detect and monitor these impairments, spirometry measures the maximal volume and speed of air that is forcibly exhaled after taking a maximal inspiration. Forced Vital Capacity (FVC) is defined as total exhaled volume after full inspiration. Speed of expired air is determined by dividing the volume of air exhaled in the first second, *i.e.,* the Forced Expiratory Volume in One Second (FEV_1), by the total FVC to give the FEV_1/FVC ratio. Values obtained from accurate and repeatable spirometry testing are then compared to reference predicted values, which are averages expected for a person of the same gender, age, height, and race as the employee being tested. A spirometry result that is 100 percent of the predicted value for a person of the same gender, age, height, and race indicates that the individual being tested has average lung function (OSHA, 2013). Depending upon the race of the individual and the reference value group being used, an adjustment may need to be made on the basis of race. This issue is discussed at greater length later in this section. Values are also compared to the employee's previous measurements.

Currently, § 1910.1043(h)(2)(iii) requires that health care providers conducting medical surveillance compare the employee's actual values to the predicted values in appendix C of the standard. Appendix C (29 CFR 1910.1043) contains predicted values derived from equations published by Knudson et al. (1976). Currently, NIOSH (CDC/NIOSH, 2003), ATS/ERS (Pellegrino et al., 2005), and ACOEM (Townsend, 2011) all recommend the Third National Health and Nutrition Examination Survey (NHANES III) as the most appropriate reference data set for assessing spirometry results for individuals in the U.S. population. Therefore, OSHA proposed (81 FR 68581) and in this final rule is now revising this provision to specify use of the NHANES III reference data set and to replace the values currently in appendix C with the NHANES III values, derived from Spirometric Reference Values from a Sample of the General U.S. Population (Hankinson et al., 1999), which are incorporated by reference.

The NHANES III data set is the most recent and most representative of the U.S. population (Hankinson et al., 1999). It lists reference values for non-smoking, asymptomatic male and female Caucasians, African Americans, and Mexican Americans aged 8- to 80-years old. Strict adherence to ATS quality control standards ensured optimal accuracy in developing this data set of spirometry values (Hankinson et al., 1999).

Section 1910.1043(h)(2)(iii) currently specifies that the ''predicted FEV_1 and FVC for blacks shall be multiplied by 0.85 to adjust for ethnic differences'' because the Knudson data set contains reference values only for Caucasians. However, such an adjustment for that race/ethnic group is no longer necessary because the NHANES III data set contains reference values for African Americans. However, the NHANES III data set does not contain reference values for Asian Americans, who typically have smaller lung volumes compared to Caucasians of the same age, height, and gender (Pellegrino et al., 2005). To obtain Asian American reference values, ATS/ERS (Redlich et al., 2014) and ACOEM (Townsend, 2011) recommend that Caucasian reference values for FVC and FEV_1 be multiplied by a factor of 0.88. Therefore, OSHA proposed and this final rule requires use of a 0.88 correction factor to obtain Asian American reference values for the FVC and FEV_1. Because race does not appear to affect FEV_1/FVC (ratio), OSHA did not propose and is not requiring to apply a correction factor to Caucasian values to derive a ratio for Asian Americans. If the NHANES data set is updated to include Asian American values in the future, and generally accepted practices endorse that data set for use in the U.S., OSHA will consider revising § 1910.1043(h)(2)(iii) to include that update.

In comments to the record, NIOSH supported use of the NHANES III spirometric reference values instead of the older Knudson 1976 spirometric reference values and the use of a correction factor of 0.88 to reference values for FEV_1 and FVC in Caucasians to determine reference values for Asian Americans (OSHA–2012–0007–0726).

While use of the NHANES III data set will simplify interpretation of spirometry results by providing reference values for more race/ethnic groups, neither the NHANES III nor the correction factor addresses every race/ethnic group. Therefore, OSHA is finalizing the proposed text indicating that FVC, FEV_1, and FEV_1/FVC values be compared to ''appropriate'' race ethnicity specific values. The term ''appropriate'' includes groups that are not represented in the NHANES III dataset. For example, using Mexican American values for non-Mexican American Hispanic workers may be appropriate. Designations of race/ethnicity are self-reported by workers, and bi-racial or multi-racial workers should select the race/ethnicity category that best describes them. OSHA's guidance document on spirometry testing provides some additional guidance on this topic, including a recommendation to use Caucasian reference values for Native American Indians (OSHA, 2013).

The software for most spirometers includes the NHANES III data set, which is identified as the Hankinson 1999 data set on some spirometers. If software for older spirometers does not include the NHANES III data set, users of those spirometers would be able to access the NHANES III values online through the NIOSH calculator (CDC/NIOSH, 2010). Tables of the NHANES III values are also available in an appendix to OSHA's spirometry guidance for healthcare professionals that is available online (OSHA, 2013). Therefore, NHANES III values are widely available to spirometry providers, including those providers using older spirometers.

Currently, paragraph (h)(2)(iii) requires an evaluation of pulmonary function testing values using predicted values of FVC and FEV_1, which are the only reference values listed in the tables in current appendix C. The NHANES III reference data set includes the lower limit of normal (LLN) as well as predicted values for FEV_1, FVC, and the FEV_1/FVC ratio. The LLN for these spirometry measurements represents the lower fifth percentile of a healthy (normal) population. That is, 95 percent of a healthy (normal) population should have spirometry values above the LLN, and spirometry values below the LLN could be abnormal (OSHA, 2013). Generally accepted practices by ATS/ERS, NIOSH, and ACOEM currently compare spirometry values to the LLN values to identify impaired pulmonary function.

In particular, ATS/ERS (Pellegrino et al., 2005) defines airways obstruction as an FEV_1/vital capacity (VC) below the LLN. ACOEM (Townsend, 2011) and

NIOSH (CDC/NIOSH, 2003) define borderline airway obstruction as an FEV_1/FVC below the LLN, with an FEV_1 between the LLN and the predicted value; they define airways obstruction as both FEV_1/FVC and an FEV_1 below the LLN. ATS/ERS, NIOSH, and ACOEM indicate that an FVC or VC less than the LLN could indicate possible restrictive impairment (Pellegrino *et al.,* 2005; Townsend, 2011; CDC/NIOSH, 2003).

Therefore, OSHA proposed and is finalizing (h)(2)(iii) to require an evaluation of FEV_1, FVC, and FEV_1/FVC against the LLN and percent predicted values to fully characterize possible pulmonary impairment in exposed workers, which is consistent with generally accepted current practices and supported by NIOSH (OSHA–2012–0007–0726). OSHA's requirement to evaluate the FEV_1/FVC ratio in addition to FEV_1 and FVC will not affect triggers for changes in medical surveillance frequency or referral for a detailed pulmonary examination, because the standard bases those triggers solely on FEV_1 values.

OSHA also proposed and is finalizing a change in the triggers for the frequency of medical surveillance. Currently, paragraphs (h)(3)(ii)(A) and (B) of the standard require frequency of medical surveillance based in part on whether the FEV_1 is above or below 80 percent of the predicted value. OSHA proposed that the basis for frequency of medical surveillance be changed to whether the FEV_1 is above or below the LLN. As noted above, generally accepted practices currently use the LLN as the basis for classifying possibly abnormal lung function. Pulmonary function normally declines with age, and the LLN better accounts for age-related declines than the current standard (Townsend et al., 2011). There is evidence that the cut-off point used by the standard, 80 percent of the predicted value, can result in erroneous lung function interpretation in adults (Pellegrino et al., 2005). Therefore, OSHA proposed and is now making final the use of the LLN to determine the frequency of lung-function testing.

OSHA also proposed and is now making a correction to § 1910.1043(n)(1). Currently, paragraph (n)(1) specifies that appendices B, C, and D of the cotton dust standard are mandatory. Since OSHA in this rulemaking is removing the old Knudson values from appendix C and reserving the appendix for future use, OSHA is modifying § 1910.1043(n)(1) to now specify that only appendices B and D are mandatory.

OSHA also makes corrections to § 1910.1043, appendix B–II, B, ''Occupational History Table.'' The table's column titled ''Tenure of Employment'' contains boxes in which dates of employment are entered. To allow the entry of dates that occurred later than 1999, OSHA proposed to change the dates to ''From 19____ or 20____'' and ''To 19____ or 20____.'' After further consideration, OSHA is finalizing this change, but with an alternation that will make the date entry even more open-ended. The agency is changing the column's two sub-headers to read as follows: ''FROM (year)'' and ''TO (year.)''

In reviewing this appendix, OSHA also noticed additional, minor technical variations from current practice and other similar forms in other health standards. In appendix B–II, A, ''Identification,'' OSHA is removing the ''age last birthday'' question because the form already asks for the employee's birthday. Additionally, OSHA is changing the measurement for height to inches (in) from centimeters (cm) and adding that the weight should be listed in pounds (lbs).

Section 1910.1043, appendix D, sets standards for spirometric measurements of pulmonary function. OSHA based the proposed changes to appendix D, which are now finalized, on the most recent spirometry recommendations from ATS/ERS (Miller et al., 2005). Many of these changes reflect advances in spirometry procedures or methods of interpretation.[5] Other changes reflect technological changes associated with the current widespread use of flow-type spirometers, in addition to volume-type spirometers, which were in widespread use in 1978 when OSHA published the current standard, and remain in use today. The changes would apply only to equipment purchased one year or more after OSHA publishes the final standard in the **Federal Register**. This would give time for distributors to exhaust existing stocks and allow medical providers to continue using the older spirometers until they buy new ones in the normal course of business. For equipment purchased on or before the one year anniversary of the **Federal Register** publication date, the original specifications in appendix D continue to apply.

Current appendix D(I)(b) specifies volume capacity for spirometers, and this final rule is changing it from seven to eight liters in appendix (D)(I)(b)(2). Current appendix D(I)(e) specifies flow rates for flow-type spirometers, and the final rule is changing it from 12 to 14 liters per second in D(I)(e)(2). These revisions to appendix D(I)(b) and (e) reflect current recommendations by ATS/ERS (Miller et al., 2005).

Current appendix D(I)(g) requires either a tracing or display, and OSHA is revising this language in appendix D(I)(g)(2) to ''paper tracing or real-time display.'' When OSHA published the current standard in 1978, a pen linked to a physical strip chart generated tracings of expiration curves on graph paper during pulmonary testing. In contrast, most current flow-type and volume-type spirometers use computer-generated displays of expiration curves projected on the spirometer or on an attached computer screen.

In appendix D(I)(g)(2), OSHA proposed and is adding size specifications for computer-generated displays, the technology most often used today (Miller et al., 2005). An issue that was critical for tracings in 1978, and remains critical for both tracings and displays today, is that they be large enough to allow a technician to easily evaluate the technical acceptability of the expiration during testing. A large real-time display allows the technician to easily view a technically unacceptable expiration and coach the worker to achieve optimal expirations in subsequent attempts. Current appendix D(I)(g) also specifies requirements for paper tracings of the expiration curve, and requires that the tracings be of sufficient size for hand measurements to conform to appendix D(I)(a). OSHA is revising paragraph D(I)(g)(2) to indicate ''If hand measurements will be made.'' OSHA is making this change because hand measurements are rarely used, and the values currently shown in the expiration curve are usually computer generated today.

Original appendix D(I)(g) also requires the spirometer to display flow versus volume or volume versus time tracings. The revision in appendix D(I)(g)(2) requires the spirometer to display both flow-volume and volume-time curves or tracings during testing. The flow-volume curve emphasizes early expiration and allows the technician to detect problems early in the maneuver (OSHA, 2013). The volume-time curve emphasizes the end of the expiration and allows the technician to coach the patient to achieve a complete expiration

[5] Appendix D provides minimal standards that must be employed when making spirometry measurements. Users of appendix D should also consult generally accepted practices from ATS/ERS (Pellegrino et al., 2005; Miller et al., 2005), NIOSH (CDC/NIOSH, 2003), and ACOEM (Townsend, 2011) for a complete list of current spirometry standards. OSHA's spirometry guidance also outlines those practices (OSHA, 2013).

(OSHA, 2013). OSHA is also updating the paragraph to indicate that both types of curves or tracings must be stored and available for recall. This requirement to store curves will allow the assessment of results for acceptability and repeatability, once testing is concluded, and it will also make it possible to include the curves in reports to health care providers who interpret the results (OSHA, 2013).

Current appendix D(I)(h) requires that instruments be capable of accumulating volume for a minimum of 10 seconds and not stop accumulating volume before (1) the volume change for a 0.5-second interval is less than 25 millimeters, or (2) the flow is less than 50 milliliters per second for a 0.5-second interval. As noted by ATS in 1987, these end-of-test criteria, which were first included in the 1979 ATS statement, caused premature termination of exhalation and FVCs that were falsely reduced by as much as 9 percent (ATS, 1987). To avoid such falsely reduced FVCs, ATS defined end-of-test criteria only according to volume change from 1987 onward (ATS 1987, 1994, 2005). Therefore, OSHA is updating the first clause in appendix D(I)(h)(2) by specifying the currently recommended volume change of less than 25 milliliters for a 1-second interval (Miller et al., 2005) and is also removing the latter clause, *i.e.,* that the instrument shall not stop accumulating volume before the flow is less than 50 milliliters per second for a 0.5-second interval. These changes that were proposed and are now final make appendix D consistent with current ATS/ERS recommendations for expiratory end-of-test criteria using volume increment only, since flow rate criteria were abandoned in 1987 (ATS, 1987; Miller et al., 2005). OSHA is also updating this provision by revising the time for which the instrument must be capable of accumulating volume to 15 seconds, the maximum time for which an exhalation should be done according to ATS/ERS (Miller et al., 2005). In 1987, ATS stated that they encourage spirometer designs that allowed patients to continue exhaling for as long as possible (ATS, 1987).

Current appendix D(I)(j), (II)(b), and (IV)(b) provide requirements for the calibration of spirometers, and the final rule updates several of these requirements. Revisions to appendix D(I)(j)(2), (II)(b), and (IV)(b) clarify that the technician must always check the calibration of spirometers, and recalibrate them only if the spirometer requires the technician to do so. That change is consistent with recommendations by ATS/ERS (Miller et al., 2005). The reason for the change is that while technicians cannot recalibrate many spirometer models in current use, they nevertheless must check the volume accuracy of all spirometers; this ensures that the spirometers are operating within calibration limits, *i.e.,* that the spirometers are accurate (OSHA, 2013). In addition, appendix D(II)(b) was revised to indicate that the calibration check is to assess the volume accuracy of the spirometer and that calibration checks be done daily, or more frequently if specified by the spirometer manufacturer when the spirometer is in use. This language, which is more specific than the proposed ''check all spirometers regularly,'' was suggested by NIOSH, based on ATS/ERS (Miller et al., 2005) recommendations (OSHA 2012–0007–0726). NIOSH also commented that OSHA may want to note that when performing calibration checks, it is the volume accuracy of the spirometer that is being validated (OSHA–2012–0007–0726).

OSHA proposed and is making in the final rule a number of changes to appendix D(I)(j): First, it is not including the following text in appendix D(I)(j)(2) because it is ambiguous and provides no useful information: ''. . . with respect to the FEV_1 and FVC. This calibration of the FEV_1 and FVC may be either directly or indirectly through volume and time base measurements.'' The second update to appendix D(I)(j)(2) includes the current ATS/ERS requirements for calibration-syringe accuracy and volume displacement (Miller et al., 2005). As noted above, OSHA is revising the term ''calibration'' to ''calibration check.'' Another change to paragraph D(I)(j)(2) is to revise the term ''calibration source'' to ''calibration syringe'' because a syringe is the only type of calibration source currently used, so specifying a syringe instead of a source would clarify the requirement.

In addition, OSHA changed the word ''should'' in D(I)(j)(2) to ''shall,'' so the new D(I)(j)(2) would read, ''the volume-calibration syringe shall provide a volume displacement of at least 3 liters and shall be accurate to within ±0.5 percent of 3 liters (15 milliliters).'' The phrase ''should'' sounds advisory, and the current practices OSHA is updating are based on the 3 liter size of the syringe. There were no comments addressing this point.

Current appendix D(II)(b) provides that technicians should perform calibrations using a syringe or other source of at least two liters. The change in the syringe volume to three liters is consistent with current practices. OSHA also is changing the term ''syringe or other volume source'' to ''syringe'' for the reasons described above in the discussion of paragraph D(I)(j). Another change to appendix D(II)(b) is to delete the phrase ''or method.'' The meaning of that phrase is unclear; the sentence is addressing calibration checks of an instrument (*i.e.,* spirometer), not a method. OSHA also is updating calibration check procedures for flow-type and volume-type spirometers to determine whether a spirometer is recording 3 liters (L) of air ±3.5 percent (Miller et al., 2005; OSHA, 2013). The check of flow-type spirometers would involve the injection of air at three different speeds, and the check of volume-type spirometers would involve a single injection of air and a check for spirometer leakage. Users should refer to generally accepted practices and other guidance for complete details about calibration checks (see, *e.g.,* Miller et al., 2005; Townsend, 2011; OSHA, 2013). OSHA is also changing the term ''recalibration'' in this provision to ''calibration checks'' for the reasons stated above in the discussion of paragraph D(I)(j). Finally, OSHA is changing ''should'' to ''shall'' in the first sentence of D(II)(b) for the same reasons as discussed above regarding paragraph D(I)(j).

Appendix D(II)(a) currently contains requirements for measuring forced expirations, including having the patient make at least three forced expirations. OSHA is updating this paragraph to have the worker perform at least three, but no more than eight, forced expirations during testing. This change would clarify that up to eight forced expirations can be attempted to obtain three acceptable forced expirations (Miller et al., 2005). The same paragraph currently states that ''The subject may sit, . . .'' OSHA proposed that ''subject'' be changed to ''patient'' primarily because ''subject'' implies someone in an experimental trial. OSHA further considered this proposed change after NIOSH commented that the term ''patient'' can potentially imply a person with an illness and that a term such as ''worker'' or ''testing participant'' may be a better term (OSHA–2012–0007–0726). OSHA has decided that worker is the appropriate term to use since it refers to the individual being tested and has updated appendix D(II)(a) to indicate ''worker'' instead of ''subject.'' The terms ''patient'' or ''subject'' were also revised to ''worker'' in appendix D(I)(g)(2), D(III)(a) and D(IV)(c). OSHA also is clarifying the text in paragraph D(II)(a) to indicate that the expiration must be repeatable. The term

''repeatability,'' now used by ATS/ERS, would be an update to the existing term ''reproducibility''; paragraph D(II)(a)(7) lists the criteria for repeatable (formerly, reproducible) results. In addition, appendix D(II)(a) lists elements of ''unacceptable'' efforts in paragraphs (a)(1)–(a)(7); OSHA revises this language to ''technically unacceptable'' to make clear that the problem is not with the worker's lungs but with the flaws in how the test is conducted.

Appendix D(II)(a)(3) currently specifies that a worker's efforts during testing are unacceptable when the expiration does not continue for at least five seconds or until an obvious plateau in the volume-time curve occurs. The revision to this paragraph clarifies that results may be acceptable if the worker *attempted to exhale* (versus actually exhaled) for at least six seconds *and* the volume-time curve shows no change in volume (<0.025 L) for at least one second (Miller et al., 2005). The change was made because OSHA agrees with a NIOSH comment that OSHA should specify the ATS/ERS (Miller et al. 2005) criteria of <0.025 L for at least one second rather than ''an obvious plateau'' (OSHA–2012–00070–0726). Therefore, the expiration must meet both of these criteria for a spirometry result to be technically acceptable. Many workers who are young or have small lung volumes can complete an expiration in less than six seconds, and their results may be acceptable if the technician observes no change in volume in the volume-time curve (OSHA, 2013).

Current appendix D(II)(a)(4) provides that the results are unacceptable when the worker coughs or closes the glottis during forced expiration. OSHA is revising the paragraph to clarify that the results are unacceptable if coughing occurs in the first second of expiration, a condition that is consistent with current ATS/ERS recommendations (Miller et al., 2005). Coughing in the first second interferes with measurement of the FEV_1 (Miller et al., 2005), but coughing toward the end of the expiration does not affect test results (OSHA, 2013). Glottis closure at any time may result in premature termination of the expiration (Miller et al., 2005).

Current appendix D(II)(a)(6) provides that the results are unacceptable when there is an unsatisfactory start to expiration characterized by excessive hesitation, *i.e.,* one with an extrapolated volume greater than 10 percent of the FVC on the volume-time curve. As noted in the 1987 ATS statement, a criterion of 10 percent could result in a falsely elevated FEV_1 from a suboptimal effort (ATS, 1987). The change to appendix D(II)(a)(6) indicates that extrapolated volume must be less than 150 milliliters or 5 percent of the FVC, whichever is greater, to be unacceptable. This change updates the provision to be consistent with the most recent ATS/ERS recommendation on criteria for start-of-test so that an accurate time zero is set (Miller et al., 2005). All ATS or ATS/ERS statements define acceptable start-of-test criteria according to volume, as well as percent FVC, using whichever criterion is larger for a given patient (ATS, 1979, 1987, 1994; Miller et al., 2005), and it is not clear why the volume value was excluded from the current cotton dust standard. OSHA is also including the 2005 ATS/ERS recommendations for volume, in addition to percentage of FVC, for consistency with ATS/ERS. Expressing the values as both percentage of FVC and as a volume, and using whichever approach gives the larger allowed extrapolated volume, aids in the interpretation of results for individuals with very small or very large lung volumes. For example, since 5 percent of FVC will be less than 150 milliliters in individuals with FVC <3.00 L, the 150 milliliter criterion would be used for those patients. But 5 percent of FVC would exceed 150 milliliters in individuals with FVC >3.00 L, so in that case the 5 percent of FVC criterion would be used to evaluate the start-of-test for these patients.

As stated above, appendix D(II)(a)(7) contains criteria for acceptable repeatability. Editorial changes proposed in appendix D(II)(a)(7) are for clarification. Notably, OSHA removed the word ''three'' because technicians can examine up to eight acceptable curves to select the two highest FEV_1 and FVC values (Miller et al., 2005). OSHA also changed ''variation'' to ''difference'' because ''difference'' is the more appropriate mathematical term to use when comparing only two numbers.

In appendix D(II)(a)(7), OSHA also revised the maximum difference between the two largest FVC values and the two largest FEV_1 values of a satisfactory test to 150 milliliters, a change from the current maximum difference of 10 percent or ±100 milliliters, whichever is greater. This revision to the criteria for acceptable repeatability reflects current ATS/ERS recommendations (Miller et al., 2005). In 2005, ATS/ERS stated that many patients are able to achieve repeatability of FEV_1 and FVC to within 150 milliliters (Miller et al., 2005). In 1994, the ATS changed its repeatability criterion from a volume and a percentage difference between values to a volume difference only, so that the criterion was equally stringent for all lung sizes, and also so that it was easy to compute during the test if hand-measurements were made (ATS, 1994). OSHA is also making editorial changes to make it clear that the difference between the two largest acceptable FVC values ''shall'' not exceed 150 milliliters and the two largest acceptable FEV_1 values ''shall'' not exceed 150 milliliters. OSHA inadvertently proposed that the term ''should not exceed'' be used, and the agency is revising the term to indicate ''shall not exceed.'' The change is consistent with other changes being made to this regulation because the word ''should'' sounds advisory (see, *e.g.,* changes to D(I)(j)(2)).

The agency discussed final changes to appendix D(II)(b) above.

OSHA is removing appendix D(III)(b). The paragraph refers to a NIOSH guideline that specifies an outdated evaluation criterion of FEV_1/FVC ratio of 0.75 percent, and OSHA is unaware of an updated NIOSH cotton dust guideline that more appropriately compares the FEV_1/FVC ratio to LLN. As noted above, generally accepted practices use the LLN as the basis for classifying possibly abnormal lung function because it accounts for age-related declines in lung function (Townsend, 2011). Appendix D(III)(b) also refers to a table that OSHA never included in the final cotton dust standard. That table was most likely Table XII–12 in the NIOSH criteria document for cotton dust (CDC/NIOSH, 1974). The lack of the table does not appear to be a pressing issue since no user complained about the missing table after OSHA promulgated the standard. In addition, the information is available to users in the NIOSH criteria document.

The updates to current paragraphs D(IV)(a) and (d) change ''reproducibility'' to ''repeatability'' to conform to the terminology now used by ATS/ERS (Miller et al., 2005). ''Repeatability'' would have the same meaning as ''reproducibility.'' OSHA also is changing the term ''calibration'' in paragraph D(IV)(b) to ''calibration checks'' for the reasons stated above in the discussion of paragraph D(I)(j).

A commenting organization, Change to Win, generally supports OSHA's revisions of the cotton dust standard; however, it articulates the following reservations: (1) The lack of accounting for the ''healthy worker effect'' seen in epidemiological studies that results from the use of the NHANES population-based data, which may result in ''false positives'' (*i.e.,* the worker appears to be normal when in

fact they only look normal compared to a ''sicker'' general population); and (2) the lack of a requirement for the employer to look at results of all the exposed workers to see if trends may indicate an inadequacy of exposure control (OSHA–2012–0007–0759). OSHA appreciates these concerns and acknowledges that some workers may have above average lung function. However, paragraph (h)(3)(iv) requires periodic medical examinations for some workers, including comparisons of current examinations to previous examinations to determine whether significant changes have occurred. This might allow a physician to detect a significant change from baseline lung function in a worker who otherwise has above average lung function compared to a reference population. OSHA agrees that evaluating pulmonary function testing results of all exposed workers may provide useful information for employers and employees; this action is not required by the agency because it goes beyond the scope of this effort, which is to simply update the standard to make it consistent with current practices and technologies.

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3. Subpart F of Part 1915—General Working Conditions, Definitions in 29 CFR 1915.80

Existing requirements in the sanitation standard for Shipyard Employment, § 1915.88(j)(1) and (2), specify that employers must, to the extent reasonably practicable, clean and maintain workplaces in a manner that prevents vermin infestation. When employers detect vermin, they must implement and maintain an effective vermin-control program.

Paragraph (b)(33) of § 1915.80 defines the term ''vermin'' as ''insects, birds, and other animals, such as rodents and feral cats, that may create safety and health hazards for employees.'' After stakeholders raised concerns about the inclusion of ''feral cats'' in the definition of vermin, OSHA proposed to remove the term ''feral cats'' from the definition in § 1915.80(b)(33). This final rule enacts the proposed removal without change.

OSHA received over 700 comments in response to the NPRM, over 500 of which addressed the removal of the term ''feral cats'' from the definition of vermin. Each of the comments favored the proposed change. Many of these comments (250) were from a mass mail campaign with the following comment:

> Just because these cats aren't pets doesn't mean they're not cared for. Indeed, many shipyard employers and their employees value the cats both for companionship and as a means of controlling rodent populations. Classifying shipyard cats as ''vermin'' will likely lead to their mistreatment and interfere with the trap-neuter-return (TNR) programs used to manage their numbers and keep the cats healthy. OSHA is a very influential agency. By removing cats from the definition of ''vermin,'' OSHA is setting an important example for other government agencies to establish policies that more effectively protect cats and promote public health and safety.

Most of the remaining comments contained similar points, such as, OSHA should not classify cats as vermin; cats should be treated humanely; and some cats may be mistreated if OSHA left the definition as is. In addition, commenters stated that cats in fact assist at shipyards in controlling vermin, such as rodents and mice, without the hazards associated with the use of pesticides or chemicals.

After considering these comments, OSHA has decided to remove the term ''feral cats'' from the definition of vermin in § 1915.80(b)(33). Removing the term ''feral cats'' is consistent with the general industry sanitation standard provision on vermin, which describes vermin as ''rodents, insects, and other vermin'' (§ 1910.141(a)(5)). OSHA does not believe that removing the term ''feral cats'' from the definition will reduce worker health and safety, and notes that feral cats may help reduce the presence of vermin. To the extent feral cats pose a safety or health hazard at any particular shipyard, OSHA will consider the cats to be ''other animals'' under the standard. The final rule is identical to the proposed rule.

4. Subpart D of Part 1926—Occupational Health and Environmental Controls, Medical Services and First Aid in 29 CFR 1926.50

Under 29 CFR 1926.50, employers must provide specified medical services and first aid to employees to address serious injuries that may occur on the job. Since 1979, OSHA has required the posting of telephone numbers of

physicians, hospitals, or ambulances for worksites located in areas where 911 emergency service is not available. OSHA adopted this requirement when 911 emergency service was still a relatively new concept, and was available only in certain parts of the country. The final rule is identical to the proposed rule.

Today, 911 emergency service is available almost everywhere in North America. In nearly all locations in the United States and Canada, a 911 call over a land-line telephone will link the caller to an emergency-dispatch center. In the United States, most localities with 911 service also have so-called ''Enhanced 911,'' which will not only connect the land-line caller to a dispatcher, but also will automatically provide the caller's location to the emergency dispatcher. This automatic-location information is critical for emergency responders in cases when the 911 caller does not know his/her exact location, or does not have sufficient time to provide such information.

Although the automatic transmission of location information to emergency dispatchers is customary for land-line telephones, the task of automatically transmitting location information is more complex when the emergency call originates from a wireless telephone. Since 1996, the Federal Communications Commission (FCC) has been phasing in the requirement that wireless carriers adopt technologies that provide 911 caller-location information. The last phase-in benchmark for wireless handsets occurs in January of 2019.[6] As a result, in some remote areas of the country, wireless-telephone carriers still are unable to provide accurate information about the location of the 911 caller to 911 answering centers. OSHA proposed revisions to § 1926.50(f) to update the 911 service-posting requirements consistent with the current status of land-line and wireless-telephone technologies.

The proposed revisions addressed the problem of locating callers, usually cell-phone callers, in remote areas that do not have automatic-location capability. In such areas, the proposed revisions required employers to post in a conspicuous location either the latitude and longitude of the worksite or other location-identification information that effectively communicates the location of the worksite. Employers can obtain information about which counties, or portions of counties, are exempted from the 911 location accuracy requirements from FCC PS Docket No. 07–114, which is publicly available on the FCC's Electronic Comment Filing System (ECFS) web page: *apps.fcc.gov/ecfs/proceeding/view?name=07-114.*

The proposed revisions also required employers to ensure that the communication system they use to contact ambulance service is effective. Under § 1926.50(e), employers are required to provide a communication system for contacting ambulance service, or proper equipment for transportation of an injured person. When using wireless telephones as a communication system, however, that system's availability varies based on the location of the caller. If an employer is relying upon a communication system at a worksite, it must be effective at the worksite. OSHA did not propose any changes to the requirement to post telephone numbers of physicians, hospitals, or ambulances for worksites located in areas where 911 emergency service is not available.

OSHA received two comments on the revision of § 1926.50, from North America's Building Trades Unions (NABTU) (OSHA–2012–0007–0742) and the Laborers' Health & Safety Fund of North America (LHSFNA) (OSHA–2012–0007–0757). Both comments supported the revision. The comment from LHSFNA noted that ''[m]any construction sites are in remote locations (*e.g.,* pipeline work, highway construction and windmill sites) where cell phone coverage is inconsistent. . . .This proposed revision could save many lives on remote construction sites.'' After considering these comments, OSHA is revising the standard as proposed in the NPRM. The final rule is identical to the proposed rule.

5. Subpart D of Part 1926—Occupational Health and Environmental Controls, Gases, Vapors, Fumes, Dusts, and Mists in 29 CFR 1926.55

The provisions of § 1926.55 establish permissible exposure limits for numerous toxic chemicals used during construction activities. These provisions are the construction counterpart to the general industry standard at § 1910.1000. OSHA proposed clarifications for several of these provisions, notably paragraphs (a) and (c) and appendix A to § 1926.55. The final rule is identical to the proposed rule, with the addition of an asterisk and a non-substantive, formatting change to appendix A to § 1926.55. OSHA proposed that the phrase ''threshold limit values'' (TLV) be revised to ''permissible exposure limits'' (PELs) and that the references to the American Conference of Governmental Industrial Hygienists (ACGIH), in both paragraph (a) and appendix A, be eliminated, as the original language was confusing. While OSHA originally adopted these limits from ACGIH recommendations, the limits are OSHA, not ACGIH, requirements. OSHA received two comments in response to this first proposed revision of § 1926.55. The North American Insulation Manufacturers Association (NAIMA) (OSHA–2012–0007–0701) agreed the current language in the standard is confusing and the proposed revisions were preferable. The American Industrial Hygiene Association (AIHA) supported the change to refer to the limits as PELs but requested that OSHA include a reference to the ACGIH Threshold Limit Values of Airborne Contaminants for 1970 in the standard (OSHA–2012–0007–0734). The comment did not state a reason to maintain the reference to ACGIH. OSHA acknowledges that these PELs are based on the ACGIH values, but these PELs are enforceable OSHA requirements. After considering these comments and to avoid possible confusion, OSHA has decided to revise the standard as proposed to use the phrase ''permissible exposure limits'' and to not include the references to ACGIH in the regulatory text and appendix A.

Second, the phrase ''shall be avoided'' in paragraph (a) is confusing as to whether it indicates the provision is mandatory, as intended, or advisory and is not appropriate in regulatory text. OSHA proposed revising this language to read, ''An employee's exposure . . . must at no time exceed the exposure limit given for that substance.''

Third, the words ''inhalation, ingestion, skin absorption, or contact'' in paragraph (a) are redundant and confusing. In addition, the concentrations listed are airborne values, and the standard addresses exposure through any route. OSHA proposed to delete these words.

Fourth, appendix A is not an appendix but an integral part of the standard. To acknowledge this relationship, OSHA proposed to revise the heading to read, ''Table A.''

Fifth, appendix A has a column labelled ''Skin Designation'' under which an ''X'' demarcates certain substances, although the appendix provides no definition of ''X.'' The 1970 ACGIH publication, however, notes that the ''X'' identifies substances that present a dermal hazard. OSHA proposed adding a footnote to appendix A that clarifies the meaning of this designation.

Sixth, appendix A has two footnotes designated by asterisks. However, there

[6] *See* 47 CFR 20.18—911 Service.

are no asterisks in the body of the table referencing these footnotes. The first footnote, designated by a single asterisk, says, ''The PELs are 8-hour TWAs unless otherwise noted; a (C) designation denotes a ceiling limit.'' The second footnote, designated by two asterisks, states, ''As determined from breathing-zone air samples.'' OSHA proposed deleting these two footnotes, and moving the content of the footnotes to paragraphs (a)(1) and (2) of § 1926.55.

Finally, OSHA proposed correcting the cross-references to OSHA's construction asbestos standard in paragraph (c) and in appendix A. The correct cross reference is: § 1926.1101. OSHA also proposed deleting footnote 4, which was also a reference to the asbestos standard, as footnote 4 does not appear in the body of the table.

OSHA received two other comments in response to the proposed revisions of § 1926.55. North America's Building Trades Unions (NABTU) (OSHA–2012–0007–0742) submitted comments generally supporting the revisions. Laborers' Health & Safety Fund of North America (LHSFNA) (OSHA–2012–0007–0757) supported the revisions but requested that OSHA revise appendix A to align them with 2009 NIOSH skin classifications and to add a footnote to appendix A stating that these PELs are from the 1969 threshold limit values and may not be protective. OSHA recognizes that most of its PELs were issued shortly after adoption of the Occupational Safety and Health (OSH) Act in 1970, and have not been updated since that time. However, a standards improvement project is not the appropriate vehicle to change appendix A.

After considering these comments, OSHA is revising the standard as proposed with two additions. First, rather than redesignating appendix A to § 1926.55 as Table A, OSHA is dividing appendix A into two tables and designating them as Tables 1 and 2 of § 1926.55. OSHA is also revising the heading for the footnotes to these tables to correspond with this change. Appendix A did not conform with criteria for presenting tables and footnotes in the Code of Federal Regulations. When appendix A was added to the Code of Federal Regulations in 1993, OSHA adopted the format used in ACGIH's 1970 TLVs (58 FR 35076; 35089–35099). This format presented TLVs for most substances in one table and TLVs for mineral dusts in a separate table, with footnotes following the two tables. Accordingly, OSHA is designating the first table in former appendix A as Table 1, with the title ''Permissible Exposure Limits for Airborne Contaminants'', and the second table as Table 2, with the title ''Mineral Dusts.'' The footnotes are now preceded by the heading ''Footnotes to Tables 1 and 2 of this section'' to make it clear that the footnotes apply to both tables. This is a non-substantive, formatting revision. Second, OSHA is adding an asterisk to ''Skin Designation'' in Table 1 to § 1926.55, linked to the footnote about dermal hazards.

6. Subpart D of Part 1926—Occupational Health and Environmental Controls, Process Safety Management of Highly Hazardous Chemicals in 29 CFR 1926.64

To avoid unnecessary duplication, OSHA proposed replacing the entire 31 pages of regulatory text for the Process Safety Management of Highly Hazardous Chemicals (PSM) Standard for construction at § 1926.64 with a cross reference to the identical general industry standard at § 1910.119. The final rule is identical to the proposed rule. Other construction standards have similar cross references to corresponding general industry standards; for example, the Respiratory Protection Standard for construction at § 1926.103 refers to the general industry Respiratory Protection Standard at § 1910.134. The PSM standard has limited applicability to construction, mainly through paragraph (h), *Contractors.*

OSHA received three comments on the revision of § 1926.64: The North America's Building Trades Unions (NABTU) (OSHA–2012–0007–0742), the Laborers' Health & Safety Fund of North America (LHSFNA) (OSHA–2012–0007–0757), and the North American Insulation Manufacturers Association (NAIMA) (OSHA–2012–0007–0701). All three comments supported the revision. After considering these comments, OSHA has decided to replace the regulatory text of the PSM Standard for construction with a reference to the identical general industry standard, as proposed. The final rule is identical to the proposed rule.

7. Subpart E of Part 1926—Personal Protective and Life Saving Equipment, Safety Belts, Lifelines, and Lanyards in 29 CFR 1926.104

The breaking strength of a lifeline is the maximum load that it can carry without failing or breaking. The minimum breaking-strength requirement for lifelines in the safety belts, lifelines, and lanyards standard, § 1926.104(c), has been 5,400 pounds. OSHA proposed revising the minimum breaking-strength requirement for these lifelines from 5,400 to 5,000 pounds. The final rule is identical to the proposed rule.

As noted by OSHA in the proposed fall protection standard published on November 25, 1986 (51 FR 42718, 42726), the agency based the 5,400-pound requirement on the breaking strength of the then-available ¾-inch diameter manila rope used for body-belt systems and not on the forces generated in a fall. The basis for the requirement of a 5,000 pound minimum breaking-strength for lanyards and vertical lifelines adopted in the final fall protection standard at § 1926.502(d)(9) is the force generated by a 250-pound employee experiencing a force 10 times the force of gravity, plus a two-fold margin of safety. Id. The 5,000 pound requirement is also consistent with the most recent ANSI/ASSE standards Z359.1 2007 and A10.32.

For consistency, OSHA proposed revising the minimum breaking-strength requirement for lifelines in the safety belts, lifelines, and lanyards standard to 5,000 pounds. OSHA received comments on the revision of § 1926.104(c), from the North America's Building Trades Unions (NABTU) (OSHA–2012–0007–0742) and the Laborers' Health & Safety Fund of North America (LHSFNA) (OSHA–2012–0007–0757). Both of these comments supported the revision.

After considering these comments, OSHA is revising the minimum breaking-strength requirement in § 1926.104(c) to 5,000 pounds. This revision conforms § 1926.104(c) with the breaking-strength requirements in the fall protection standard at § 1926.502(d)(9). The agency also concludes that identical specifications for the same equipment eliminate confusion and, thereby, improve compliance. The final rule is identical to the proposed rule.

8. Subpart G of Part 1926—Signs, Signals, and Barricades

Subpart G has required that employers comply with Part 6 of the Manual on Uniform Traffic Control Devices (MUTCD), 1988 Edition, Revision 3, September 3, 1993 (''1988 Edition'') or December 2000 MUTCD (''Millennium Edition''). OSHA proposed to revise subpart G to update the incorporation by reference of Part 6 of the MUTCD to the November 4, 2009 MUTCD (''2009 Edition''), including Revision 1 and Revision 2, both dated May 2012. This version of the MUTCD aims to expedite traffic, promote uniformity, improve safety, and incorporate technology advances in traffic control device application (74 FR 66730, 77 FR 28455, and 77 FR 28460).

The final rule is identical to the proposed rule.

The Department of Transportation (DOT) requires that traffic control signs or devices conform to the 2009 Edition (see 23 CFR 655.601 through 655.603). DOT regulations recognize that the MUTCD is the national standard for all traffic control devices installed on any street, highway, or bicycle trail open to public travel (§ 655.603(a)). DOT requires compliance with the 2009 Edition for all federal-aid construction areas (§ 655.603(d)(3)). In addition, each State must have a highway safety program that complies with DOT's designated national standard, and where State or other federal agency MUTCDs or supplements are required, they shall be in substantial conformance with the 2009 Edition (23 U.S.C. 402(a); 23 CFR 655.603(b)(1)). Substantial conformance means that the State MUTCD or supplement shall conform as a minimum to the standard statements included in the 2009 Edition (§ 655.603(b)).

The differences between OSHA's standards that reference the MUTCD's 1988 Edition and the Millennium Edition and DOT's regulations cause potential industry confusion and inefficiency, without advancing worker safety. Accordingly, in Directive CPL 02–01–054, dated October 16, 2012, OSHA stated that it would accept compliance with the 2009 Edition in lieu of compliance with the 1988 Edition or Millennium Edition referenced in § 1926.200(g) through its *de minimis* policy.

OSHA reviewed the differences between the 1988 Edition, the Millennium Edition, and the 2009 Edition, and has concluded that the 2009 Edition will provide greater employee safety benefits than the older versions. The 2009 revisions to the MUTCD largely make the document more accessible and accounts for advances in technology. A comparison of the 1988 and 2009 Editions shows few new requirements; rather, the document is easier to use, with more guidance and supporting material available. The MUTCD is a complex document comprised of standards, guidance, and supporting material. Under § 1926.6(a), OSHA's subpart G provisions incorporate by reference only the mandatory provisions of the MUTCD, *i.e.,* those provisions containing the word ''shall'' or other mandatory language, and only those provisions that affect worker safety with regard to the use of signs, devices, barricades, flaggers, and points of hazard. Previously, it was difficult to locate these provisions, but the 2009 Edition clearly labels them ''standards.''

The revisions to the 1988 and Millennium Editions that affect worker safety are minimal. DOT identified the following areas as significant revisions that relate to work safety in the final rule (74 FR 66730):

- The needs and control of all road users through a temporary traffic-control (TTC) zone apply to all public facilities and private property open to public travel, in addition to highways.
- Federal Highway Administration (FHWA) allows non-compliant devices on existing highways and bikeways to be brought into compliance with the current edition of the MUTCD as part of the systematic upgrading of substandard traffic control devices (and installation of new required traffic control devices) required pursuant to the Highway Safety Program, 23 U.S.C. 402(a). If the FHWA establishes a target compliance date for upgrading such devices, traffic control devices shall be in compliance by that date. (These target compliance dates established by the FHWA are shown in Table I–2 of the 2009 Edition.)
- Workers within the public right-of-way must use high-visibility safety apparel.
- A new section titled ''Automated Flagger Assistance Devices'' (AFAD). These optional devices enable a flagger to assume a position out of the lane of traffic when controlling road users through TTC zones.
- New requirements that flaggers shall use a ''STOP/SLOW'' paddle, flag, or AFAD to control road users; the 2009 Edition prohibits the use of hand movements alone. In the previous editions, it was not clear that hand signals alone were insufficient.
- All devices used for lane channelization (*i.e.,* directing vehicles in a particular direction) must be crashworthy (a characteristic of a roadside appurtenance that has been successfully crash tested in accordance with a national standard such as the National Cooperative Highway Research Program Report 350, ''Recommended Procedures for the Safety Performance Evaluation of Highway Features.'')
- Temporary traffic barriers, including their end treatments (such as an impact attenuator), must be crashworthy.

There was one major revision to the MUTCD, the 2003 Edition, between the Millennium Edition and the 2009 Edition. OSHA is providing a list of the changes between the 2003 Edition and the 2009 Edition in the record (find 2009 Edition figure changes at *www.regulations.gov* in Docket No. OSHA–2012–0007).

OSHA also proposed to revise §§ 1926.200 through 1926.203 in subpart G to clarify their provisions and eliminate duplication.

Section 1926.200(g)—Traffic signs. Existing paragraph (g)(1) of § 1926.200 states, ''[c]onstruction areas shall be posted with legible traffic control signs at points of hazard.'' Accordingly, paragraph (g)(1) does not explicitly require protection by traffic control devices. However, paragraph (g)(1) requires legible signs at points of hazard, and paragraph (g)(2) prohibits misuse of both signs *and devices,* by requiring their use to conform to the MUTCD. Not requiring employers to use, but prohibiting the *misuse* of, protective devices at points of hazard is an anomaly that causes unnecessary confusion.

OSHA proposed to revise paragraph (g)(1) to explicitly require that employers use traffic control devices at points of hazard. OSHA also proposed to revise paragraph (g)(2) to clarify that it covers the design and use of traffic-control devices, and adds a list of those devices: Signs, signals, markings, barricades, and other devices. Consistent with these revisions, OSHA also proposed to revise the headings of § 1926.200 and paragraph (g) by adding the term ''devices'' to these headings. The agency will retain the requirement that signs be legible.

Section 1926.201—Signaling. The agency proposed limiting revisions to § 1926.201 to the 2009 Edition update discussed above.

Section 1926.202—Barricades. OSHA proposed deleting this section because it duplicates the requirements in the revisions to paragraph (g)(1), which require the use of barricades as traffic control devices at points of hazard, and paragraph (g)(2), which require that the design and use of barricades conform to the updated MUTCD.

Section 1926.203—Definitions applicable to this subpart. OSHA proposed deleting this section because the MUTCD defines or describes most of the words defined in this section (*e.g.,* barricade, signs, and signals). To the extent that other provisions of subpart G use the defined words but do not reference the MUTCD, providing definitions for these words is unnecessary because the meanings of the words are either obvious or defined in applicable consensus standards or in other OSHA standards; for example, an adequate description of a ''tag'' is in § 1926.200(h).

OSHA received three comments on the proposed revisions to subpart G. OSHA received a comment of general support from Laborers' Health & Safety

Fund of North America (LHSFNA) (OSHA–2012–0007–0757). A comment from North America's Building Trades Unions (NABTU) (OSHA–2012–0007–0742) supporting the proposed revisions also and requested that OSHA ''make clear that these requirements apply not only to flaggers on road construction projects, but also pedestrian employees working in the work zone. Pedestrian workers are at risk of being injured and/or killed by vehicles inside the work zone. Both flaggers and pedestrian workers should be protected by the MUTCD provisions.'' The provisions of §§ 1926.200(g) and 1926.201(a) protect all workers in construction areas with exposure to traffic. The signaling provision, § 1926.201(a), instructs flaggers to comply with the MUTCD on signaling and on what garments to wear. Following these provisions protects all workers, not only flaggers. OSHA does not see a need to specifically state in the standard that all workers are protected. OSHA also received a comment from American Road & Transportation Builders Association (ARTBA) (OSHA–2012–0007–0754). This comment supports the revision and states that updating to the newest edition of the MUTCD will alleviate uncertainty and confusion caused by OSHA's reference to multiple versions of the MUTCD in existing standards. The comment also supports OSHA's clarification of the standards related to signage, signaling, and barricades in subpart G.

After considering these comments, OSHA has decided to update the references to the MUTCD in subpart G to the 2009 Edition as well as revise §§ 1926.200 through 1926.203 as proposed. Updating the references to the 2009 Edition MUTCD eliminates confusion as to which edition employers must comply with, and will inform employers that compliance with DOT regulations will not conflict with outdated OSHA regulations. The other revisions clarify subpart G's provisions and eliminate duplication. The final rule is identical to the proposed rule.

In summary, OSHA is revising the safety and health regulations for construction to adopt and incorporate the 2009 Edition of the MUTCD and clarify the regulatory text. The revisions delete the references in §§ 1926.200(g)(2) and 1926.201(a) to the 1988 Edition and Millennium Edition of the MUTCD and insert references to the 2009 Edition. The revisions also revise the regulatory text of paragraphs (g)(1) and (2) of § 1926.200 to eliminate confusion regarding OSHA's interpretation of the existing text. OSHA is deleting § 1926.202 because it duplicates the requirements in the revisions to §§ 1926.200(g) and 1926.203 because the revisions make this section unnecessary.

9. Subpart H of Part 1926—Materials Handling, Storage, Use, and Disposal, General Requirements for Storage in 29 CFR 1926.250

Subpart H of OSHA's construction standards governs the handling, storage, use, and disposal of construction materials on a work site. Section 1926.250 addresses safe storage of building materials inside buildings under construction, and § 1926.250(a)(2) requires employers to post maximum safe load limits of floors in storage areas. This requirement is important during the construction of large buildings because employers often store heavy building materials in these structures on upper floors to accommodate construction staging and schedules. If the weight of stored materials and equipment exceed the maximum safe load limit of the floor, then there is a risk of a localized failure of the floor and structural collapse. However, requiring employers to post safe load limits is unnecessary in residential construction because employers do not place heavy materials in storage areas above floor or slab on grade. Therefore, OSHA proposed revising § 1926.250(a)(2) to exclude residential construction from the posting requirement. The final rule differs from the proposed rule. The final rule uses the term ''all single-family residential structures and wood-framed multi-family residential structures'' instead of ''detached single-family dwellings or townhouses that are under construction.'' The final rule also contains organizational changes to the proposed language.

OSHA received three comments on the revision of § 1926.250(a)(2), from the North American Insulation Manufacturers Association (NAIMA) (OSHA–2012–0007–0701), the National Association of Home Builders (NAHB) (OSHA–2012–0007–0747), and the North America's Building Trades Unions (NABTU) (OSHA–2012–0007–0742).

OSHA addresses the comment from NAHB first. The comment supports the proposal to exclude detached, single family residences and townhouses from the load limit posting requirements in § 1926.250(a)(2). NAHB suggests the load limits for floors in residential construction in the United States are uniform and that the weight of materials stored on upper floors are within the safety factor of the supporting material. The comment notes that the International Residential Code (IRC) ''has been adopted and is generally used as a base building code standard throughout most of the United States.'' The IRC ''is a comprehensive, stand-alone residential building code addressing the design and construction of one- and two-family dwellings and townhouses not more than three stories above grade'' and ''has specific design requirements for live loads (*i.e.,* weight of occupants, furnishings, etc.) placed on floors.'' The comment gives an example of what a larger load imposed on an upper floor of a residential home under construction might be: ''a stack of 25 (gypsum board or drywall) is well within the inherent factors of safety, particularly since it is only imposing a short-term load.''

While this comment supports OSHA's proposed revisions, it requests that OSHA change ''detached single-family dwellings or townhouses that are under construction'' to ''residential home building'' or ''residential home construction'' to be in line with the language used in OSHA's Compliance Guidance for Residential Construction, STD 03–11–002. ''Residential construction'' means that the end-use of the building in question must be as a home or dwelling and must be constructed using traditional wood frame construction materials and methods. A comprehensive explanation of OSHA's definition of ''residential construction'' is in STD 03–11–002, which is located in the docket for this rulemaking.

NAIMA submitted a comment in support of the proposed changes, stating, ''safe load limit requirements are unnecessary for single-family home construction as they do not store heavy materials that could endanger employees working at lower levels.''

The agency received a comment opposed to the proposed revisions from NABTU. Their comment states that it is possible that during the construction of townhouses, ''one unit may be used as a material depot during the procurement and construction phase.'' OSHA understands that it is possible for excessive loads to be stored on any floor during residential construction, but it is not industry practice to store loads for extended periods on the upper floors of the types of residential buildings excepted by this revision. NABTU's comment goes on to say that ''[o]btaining maximum safe loads information is not an extra burden on employers.'' The fact that employers no longer will need to post signs in storage areas in residential construction does not mean they are relieved of their duty to know the safe load limits and ensure the safety of workers. As noted above,

load limit requirements in residential construction are mostly uniform in the United States, and materials that are typically stored are well within the safety factor. OSHA has requirements that require safe load limits not be exceeded without requiring the posting of such limits. For example, § 1910.22(b) requires that a walking-working surface support the maximum intended load for that surface and does not require the posting of the load limit. Finally, this comment correctly notes that employers must ensure the weight of stored materials does not exceed safe load limits. It also argues that the posting of signs in residential construction ''increase awareness'' regarding load limits ''even if the likelihood is low'' for error or incidents. OSHA does not dispute that more information and sign posting in general can increase safety on a job-site, but in this case, the posting of load limits in storage areas of residential construction sites does not increase or decrease the level of safety.

After considering these comments, OSHA is revising § 1926.250(a)(2) to exclude all single-family residential structures and wood-framed multi-family residential structures from the posting requirement. The final revisions to the regulatory text are somewhat different than the revisions in the proposed rule. First, OSHA has named the subsection ''Load Limits'' for identification purposes. Second, the revision moves the requirement that the weight of storage materials not exceed safe load limits from the end of the subsection to the beginning. This change makes clear that the duty to ensure that any loads placed on floors do not exceed the maximum safe loads of the floors exists regardless of whether or not employers are required to post the safe load limits. Third, the revision changes the style of language used to be more in line with the language used throughout subpart H. Finally, OSHA agrees with the first commenter and has determined that the use of the words ''all single-family residential structures and wood-framed multi-family residential structures'' is more appropriate than the proposed ''detached single-family dwellings or townhouses that are under construction.'' OSHA considered using the words ''residential construction'' to be in line with the language used in 29 CFR part 1926, subpart M, and STD 03–11–002, but this would limit the exception to structures constructed using traditional wood frame construction materials and methods. The revision covers all single-family residential structures, regardless of the materials or methods used during construction, and multi-family residential structures constructed using traditional wood frame construction materials and methods.

OSHA finds that the revision will lessen the compliance burden of employers without jeopardizing the safety of employees. While employers involved in residential construction do not place heavy loads on the floors of these structures, the revision does not relieve employers of the duty to ensure that any loads placed on these floors do not exceed the maximum safe loads of the floors.

10. Subpart S of Part 1926—Underground Construction, Caissons, Cofferdams and Compressed Air, Underground Construction in 29 CFR 1926.800

OSHA has required, under § 1926.800(k)(10)(ii), that mobile diesel-powered equipment used in ''other than gassy operations'' underground be approved by the Mine Safety and Health Administration (MSHA) in accordance with the provisions of 30 CFR part 32, or that the employer can demonstrate that the equipment is ''fully equivalent'' to MSHA-approved equipment. In 1996, MSHA revoked part 32 and replaced it with updated provisions in 30 CFR part 7, subpart E, and 30 CFR 75.1909 Non-permissible diesel-powered equipment;[7] design and performance requirements, 75.1910 Non-permissible diesel-powered equipment; electrical system design and performance requirements, and 75.1911 Fire suppression systems for diesel-powered equipment and fuel transportation units (61 FR 55412). Those sections are rules for coal mines. In 2001, MSHA issued 30 CFR 57.5067, which permits operators in metal and nonmetal mines to use engines that meet Environmental Protection Administration (EPA) requirements for engines as an alternative to seeking MSHA approval under part 7, subpart E (66 FR 5706). Under 30 CFR 57.5067, all engines used in underground metal and nonmetal mines must have an affixed plate evidencing approval of the engine pursuant to 30 CFR part 7, subpart E, or meet or exceed the applicable requirements of the EPA listed in MSHA Table 57.5067–1. OSHA proposed to update the regulatory language in § 1926.800(k)(10)(ii) to cross-reference these updated provisions. The final rule contains differences from the proposed rule. The final rule requires compliance only with § 57.5067, pertaining to underground metal and nonmetal mines, and not §§ 75.1909, 75.1910, and 75.1911(a) through (i), pertaining to underground coal mines. The final rule also contains minor technical changes to the proposed language.

OSHA received two comments on the proposed changes. One was from Caterpillar Inc. (OSHA–2012–007–0762). That comment supported the changes regarding the substitution of 30 CFR 57.5067 for former part 32, but recommended that OSHA not require compliance with §§ 75.1909, 75.1910, and 75.1911(a) through (i) of part 30. The comment explained that requiring compliance with §§ 75.1909, 75.1910, and 75.1911(a) through (i) of part 30, ''would create some conflict or, at the least, confusion . . . and inappropriately add underground coal-mining equipment requirements to equipment used in non-coal environments.''[8]

Caterpillar recommended that OSHA not require compliance with §§ 75.1909, 75.1910, and 75.1911(a) through (i) of part 30 because those standards apply to equipment used in underground coal mines, while 30 CFR 57.5067 applies to equipment used in underground metal and nonmetal mines. Caterpillar stated, and the agency agrees, that equipment used for underground construction is more closely related, and often the same, as equipment used in underground metal and nonmetal mines. Caterpillar suggested that OSHA look at alternative standards related to equipment used in underground metal and nonmetal mines (while maintaining that only requiring compliance with 30 CFR 57.5067 regarding engines is necessary), such as 30 CFR 57.14100 through 57.14162—Safety Devices and Maintenance Requirements or 30 CFR 57.5060 through 57.5075—Diesel Particulate Matter—Underground Only. After review of these MSHA standards, OSHA has determined that requiring compliance with either the Safety Devices and Maintenance Requirements or Diesel Particulate Matter—Underground Only standards would go beyond the scope of § 1926.800(k)(10)(ii) and be in conflict with other parts of subpart S. Section 1926.800(k)(10)(ii) is in the ventilation subsection and is concerned with diesel exhaust and compliance with 30 CFR 57.5067 is sufficiently equivalent to the original standard that required compliance with former part 32. Further, requiring compliance with 30 CFR 75.1909, 75.1910, and 75.1911(a) through (i) is

[7] Non-permissible equipment may not be used in gassy operations.

[8] OSHA hosted a conference call with Caterpillar to discuss its comment, a summary of which is found in the docket for this rulemaking.

actually inconsistent with 30 CFR 57.5067, as that latter section allows engines to be approved pursuant to 30 CFR part 7, subpart E, *or* meet or exceed the applicable requirements of the EPA listed in MSHA Table 57.5067–1. Therefore, OSHA agrees that the proposed rule is unworkable, and the final rule will require compliance with only 30 CFR 57.5067 as recommended.

Further, OSHA solicited comment on whether employers use the option in the current standard to demonstrate that equipment is ''fully equivalent'' to MSHA-approved equipment. OSHA received no comment on this provision, therefore all new engines used that are covered by subpart S will have to comply with 30 CFR 57.5067.

The other comment was from the Laborers' Health & Safety Fund of North America (LHSFNA) (OSHA–2012–0007–0757). This comment supported updating the reference to current MSHA regulations, but opposed the grandfathering of older equipment. As OSHA explains below, to avoid the cost of replacing current equipment, OSHA will grandfather older equipment that complies with existing § 1926.800(k)(10)(ii). OSHA notes, however, that 30 CFR 57.5067 was issued seventeen years ago, so the amount of equipment that would not be in compliance with the current requirement is not that large and will continue to diminish.

Based on available information, OSHA has determined that currently manufactured equipment meets the proposed requirements and is generally compliant with the more stringent EPA Tier 3 and Tier 4 emission requirements (ERG, 2015). The agency concludes that all applicable new equipment currently available in the market meets the final rule requirements. OSHA recognizes that there may be some employers using equipment that predates the newer MSHA standards, and the EPA requirements referenced in them. To avoid the costs of replacing existing equipment in use that are compliant with the current standard, the agency proposes to allow equipment purchased before the effective date of the final rule to continue to comply with the terms of existing § 1926.800(k)(10)(ii) (including having been approved by MSHA under 30 CFR part 32 (1995) or be determined to be equivalent to such MSHA-approved equipment).

Finally, the comment from Caterpillar pointed out that 100 ft^3 equals 2.832 m^3 (not 28.32 m^3 as stated in the existing and proposed regulatory text) and suggested a reorganization of the regulatory text for clarity. The agency agrees with this suggestion and has made the applicable change to § 1926.800(k)(10)(ii) in the final rule.

11. Subpart W of Part 1926—Rollover Protective Structures; Overhead Protection

Provisions in subpart W specify minimum performance criteria for rollover protective structures (ROPS) and overhead protection on construction equipment. The agency proposed to revise the existing standards in 29 CFR 1926.1000, 1926.1001, 1926.1002, and 1926.1003 by removing the provisions that specify the test procedures and performance requirements, and replacing those provisions with references to the underlying consensus standards from which they were derived. The substantive differences between the consensus standards and OSHA's standards are minimal. The agency also proposed to remove irrelevant text from § 1926.1000. The final rule is identical to the proposed rule except for the addition of ISO 3471:2008 to § 1926.1002 and other technical corrections. While reviewing the incorporated material for this section OSHA found outdated references to former 29 CFR 1926.1501 in § 1926.6. OSHA is removing those references in this final rule.

The original source standards for the current subpart W requirements are the Society of Automotive Engineers (SAE) Standards J320a–1970, J394–1970, J395–1970, J396–1970, J334a–1970, J167–1970, J168–1970, and J397–1969. The American National Standards Institute (ANSI) and SAE subsequently canceled these standards. To design and develop new equipment, the industry now uses the most recent International Organization for Standardization (ISO) standards: ISO 3471:2008; ISO 5700:2013; and ISO 27850:2013. Though the names of the construction equipment covered by the consensus standards have changed over time, OSHA believes that all the equipment listed in § 1926.1001(a) is covered by one of those ISO standards.

For equipment manufactured after the effective date of this final rule, OSHA proposed that it meet the test and performance requirements for the applicable ISO standards discussed below. For equipment manufactured before the effective date of this final rule, OSHA proposed that it meet the former requirements of subpart W, or the test and performance requirements for the applicable ISO standards that apply to newly manufactured equipment.

OSHA received five comments on these proposed changes. The Laborers' Health & Safety Fund of North America (LHSFNA) and the North America's Building Trades Union (NABTU) supported the revisions (OSHA–2012–0007–0757, –0742). The Association of Equipment Manufacturers (AEM), NIOSH, and Paul Ayers, a private citizen, were generally supportive of these changes and recommended technical changes (OSHA–2012–0007–0699, –0726, –0740). OSHA appreciates that input and responds to specific comments below. After considering these comments, OSHA has decided to finalize the proposed revisions to subpart W with the minor changes discussed below.

OSHA is renaming § 1926.1000 as ''Scope'' because this more accurately describes what follows in this section. Paragraph (a) lists the types of equipment covered by subpart W. The agency is also adding compactors and rubber-tired skid-steer equipment manufactured after the effective date of the final rule to paragraph (a). The ISO standards apply to compactors and skid-steer equipment as well as the other equipment included in the standard, and OSHA concludes that all compactors and skid steer equipment currently produced meet those requirements. Paragraph (b) states which standards apply to equipment manufactured before the publication of this final rule. Paragraph (c) states which standards apply to equipment manufactured after the publication of this final rule. OSHA solicited comment on whether paragraphs (d), ''*Remounting,*'' (e), ''*Labeling,*'' and (f), ''*Machines meeting certain existing governmental requirements*'' are necessary or are obsolete, but received no comment in response. These paragraphs are not in conflict with the final revisions and are unchanged in the final rule. LHSFNA specifically supported the inclusion of compactors and rubber-tired skid-steer equipment in the standard, citing research on fatalities associated with compactors (OSHA–2012–0007–0757). LHSFNA also recommended that because only equipment manufactured after the effective date of the standard will be covered by revised subpart W, OSHA should study the prevalence of ROPS on existing older compactors and rubber-tired skid-steer equipment and explore the need for a rule that would require this older equipment to be retrofitted.

Section 1926.1000(c) limited the application of the requirements of §§ 1926.1001 and 1926.1002 to equipment manufactured after July 1, 1969. OSHA is eliminating this limitation because it is OSHA's understanding that there are not any

pieces of covered equipment in operation today that are more than 45 years old and do not meet the SAE standards. OSHA received no comment on this revision.

Section 1926.1001 provides ROPS requirements for rubber-tired self-propelled scrapers, rubber-tired front end loaders, rubber-tired dozers, crawler tractors, crawler-type loaders, and motor graders. The final rule deletes the ROPS specifications for this equipment, and replaces it with a requirement that covered equipment manufactured before the effective date of the final rule comply with SAE J397–1969—Critical Zone-Characteristics and Dimensions for Operators of Construction and Industrial Machinery, SAE 320a–1970—Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired, Self-Propelled Scrapers, SAE J394–1970—Minimum Performance Criteria for Roll-Over Protective Structures for Rubber-Tired Front End Loaders and Rubber-Tired Dozers, SAE J395–1970—Minimum Performance Criteria for Roll-Over Protective Structure for Crawler Tractors and Crawler-Type Loaders, and SAE J396–1970—Minimum Performance Criteria for Roll-Over Protective Structure for Motor Graders, as applicable. The final rule requires equipment manufactured after the effective date of the final rule (including compactors and rubber-tired skid-steer equipment) to meet the requirements of ISO 3471:2008, Earth-moving machinery—Roll-over protective structures—Laboratory tests and performance requirements. This standard contains specifications for ROPS to protect employees. Because, as noted above, OSHA believes that covered equipment is already being manufactured to the requirements of ISO 3471:2008, the final rule provides the option for equipment manufactured before the effective date of the final rule to comply with the ISO standard rather than the SAE standards.

Section 1926.1002 provides ROPS requirements for wheel-type agricultural equipment and industrial tractors used in construction. The final rule deletes the ROPS specifications for this equipment, and replaces it with a requirement that covered equipment manufactured before the effective date of the final rule comply with SAE J168–1970—Protective Enclosures—Test Procedures and Performance Requirement and SAE J334a–1970-Protective Frame Test Procedures and Performance Requirements, as applicable. The final rule requires equipment manufactured after the effective date of the final rule meet the requirements of ISO 5700:2013, Tractors for agriculture and forestry—Roll-over protective structures—Static test method and acceptance conditions. This standard contains specifications for ROPS to protect employees. Because, as noted above, OSHA believes that covered equipment is already being manufactured to the requirements of ISO 5700:2013, the final rule provides the option for equipment manufactured before the effective date of the final rule to comply with the ISO standard rather than the SAE standards. OSHA solicited comment on whether any equipment covered by § 1926.1002 that complies with ISO 3471:2008, the standard for earth-moving machinery, should be considered in compliance for ROPS. The comment from AEM noted that ISO 3471:2008 could be used for equipment covered by § 1926.1002 (OSHA–2012–0007–0699). Therefore, because ISO 3471:2008 requires testing at higher levels of energy than ISO–5700:2013, compliance with either ISO–5700:2013 or ISO 3471:2008 for equipment covered by § 1926.1002 is included in the final rule.

AEM also recommended updating the consensus standard that is used in prior § 1926.1002(j)(1) [now § 1926.1002(e)(1)] for the definition of ''agricultural tractor.'' OSHA is not changing the scope of equipment covered by § 1926.1002 and believes that the current definition does not require a change to be compatible with the revisions. OSHA appreciates AEM's recommendations to update this definition and to include various other standards as possible options for § 1926.1002. OSHA acknowledges that there are other consensus standards that may apply to equipment covered by subpart W. However, OSHA has chosen to adopt the ISO standards that most closely align to the current regulatory structure of subpart W.

Section 1926.1003 provides design and installation requirements for the use of overhead protection for operators of agricultural and industrial tractors used in construction. The final rule deletes the current overhead protection specifications for this equipment, and replaces it with a requirement that covered equipment manufactured before the effective date of the final rule comply with SAE J167–1970—Overhead Protection for Agricultural Tractors—Test Procedures and Performance Requirements when using overhead protection. The final rule requires equipment manufactured after the effective date of the final rule meet the requirements of ISO 27850:2013, Tractors for agriculture and forestry—Falling object protective structures—Test procedures and performance requirements when using overhead protection. This standard contains specifications for overhead protection to protect employees. Because, as noted above, OSHA concludes that overhead protection, when used, is manufactured to the requirements of ISO 27850:2013, the final rule provides the option for equipment manufactured before the effective date of the final rule to comply with the ISO standard rather than the SAE standards. NIOSH noted that ISO 27850:2013 is not the most recent industry standard (OSHA–2012–0007–0726), but AEM recommended that OSHA incorporate ISO 27850:2013 in § 1926.1003 (OSHA–2012–0007–0699). OSHA is finalizing the use of ISO 27850:2013 in § 1926.1003. AEM also recommended that OSHA incorporate ISO 3449:2005 in subpart W but OSHA is not incorporating it because there is no equivalent consensus standard in subpart W for this ISO to update.

The comment from AEM (OSHA–2012–0007–0699) asked that OSHA remove the references to the outdated SAE standards. NIOSH also noted that SAE J334a–1970 is not the current version of that standard (OSHA–2012–0007–0726). OSHA is aware that the old SAE standards have been canceled. But they were the original source standards for subpart W, and OSHA is grandfathering older equipment that met the requirements of the original subpart W and thus the original source standards. For these reasons, OSHA is retaining these source standards in the final rule but it will consider this request for any future rulemaking it undertakes on subpart W. AEM also requested that OSHA remove the prescriptive tests in subpart W, as proposed, and replace them with the ISO standards, which OSHA has done in this final rule. Finally, AEM recommended that OSHA ''acknowledge the protective structures compliant with the current industry standards incorporated by reference and judged to fully comply with OSHA 1926.1002 and 1926.1003.'' The final rule does state older equipment that meets the requirements of the current standards required for new equipment will be in compliance with subpart W. AEM and Paul Ayers also noted that there is a conversion error in subpart W, and Ayers notes that the same error is also in 29 CFR 1928.52, OSHA's rule for agriculture on protective enclosures for tractors (OSHA–2012–0007–0699, –0740). That error is eliminated in subpart W, as the prescriptive tests are deleted by this final rule. Amending the agriculture standard is beyond the scope

of this SIP–IV rulemaking, but OSHA takes note of the error.

12. Subpart Z of Part 1926—Toxic and Hazardous Substances, Coke Oven Emissions in 29 CFR 1926.1129

Section 1926.1129 regulates exposure to coke oven emissions in construction. In 1993, OSHA incorporated this standard into part 1926 (58 FR 35256, June 30, 1993) and in 1996 revised it to be just a reference to the identical general industry standard (29 CFR 1910.1029; 61 FR 31428, June 20, 1996). In neither rulemaking did OSHA discuss, in particular, the application of the coke oven standard to construction, as it was only one of many standards involved in each rulemaking. The provisions of the coke oven standard, however, do not fit construction work. OSHA thus proposed to delete § 1926.1129. The final rule enacts the proposed deletion without any other changes.

As just stated, the coke oven standard does not fit construction work. Much of the standard regulates exposure in the ''regulated area.'' (See 29 CFR 1910.1029(d)). But this ''regulated area'' is limited, including only ''[t]he coke oven battery including topside and its machinery, pushside and its machinery, coke side and its machinery, and the battery ends; the wharf; and the screening station [and the] beehive oven and its machinery'' (§ 1910.1029(d)(2)(i) and (ii)). As stated in an interpretation issued nearly contemporaneously with the general industry coke oven emissions standard, ''[t]he ground level around the base of the coke oven battery is not generally considered in the regulated area unless work related to coke oven operations take place. The coke oven regulation, 29 CFR 1910.1029, does not apply to employees walking past coke ovens or between them.'' (Interpretation memorandum to White, May 17, 1977). Any work operating the coke ovens is general industry work. OSHA recognized this issue in the 1990s, when it stated that the coke oven construction standard was ''invalid,'' and that OSHA intended to remove it from the Code of Federal Regulations. (Interpretation letter to Katz, June 22, 1999). OSHA also advised its Regional Offices in 2005 of this interpretation and that they should not enforce § 1926.1129. OSHA's inspection database contains no record of a citation under this standard since 1997.[9] For this reason, OSHA proposed to delete § 1926.1129.

[9] There were a few citations between 1993 and 1997.

OSHA received three comments on the proposed deletion, each asking OSHA to retain § 1926.1129. The North America's Building Trades Unions commented that, ''there are still 17 coke oven plants, with 54 batteries, that required industrial construction workers to perform tasks such as patching and replacing refractory bricks and other maintenance, work that potentially overexposes these workers to coke oven emissions'' (OSHA–2012–0007–0742). Based on this limited information about what the workers are doing, the work described in this scenario is likely covered by § 1910.1029, even if the work is done by ''industrial construction workers.'' The United Steel, Paper and Forestry, Rubber, Manufacturing, Energy, Allied Industrial and Service Workers International Union (USW) describes work covered by § 1910.1029 as ''heavy maintenance,'' encompassing ''[r]ebuilding, and rebricking ovens, changing doors, rebuilding and replacing equipment'' within the regulated area (OSHA–2012–0007–0764). In this example as well, based on the limited information about what the workers are doing, OSHA thinks it is likely that the work described is covered by § 1910.1029.

The Laborers' Health & Safety Fund of North America commented that eliminating § 1926.1129 could cause companies to respond by ''reclassifying work as construction work, thus exempting them from the regulation'' (OSHA–2012–0007–0757). The USW also states that ''OSHA should avoid giving [employers] such an incentive'' to reclassify work (OSHA–2012–0007–0764). Employers do not determine whether or not work is covered by the construction or general industry standards. The work itself is used to determine if it will be considered maintenance or construction. An employer whose employees are engaged in general industry work may not avoid compliance with general industry standards by ''classifying'' the work as construction.

Additionally, the USW commented that construction workers laboring near a coke oven would be deprived of ''respirators, protective clothing and personal hygiene measures'' if § 1926.1129 were to be removed (OSHA–2012–0007–0764). This is not the case. First, § 1910.1029, as discussed above, only covers the ''regulated area.'' Second, 29 CFR part 1926 contains a number of standards that apply to construction workers laboring near an active coke oven. For example, the provisions of 29 CFR part 1926, subpart C—General Safety and Health Provisions, 29 CFR part 1926, subpart D—Occupational Health and Environmental Controls, and 29 CFR part 1926, subpart E—Personal Protective and Life Saving Equipment apply to construction work near coke ovens.[10] Because § 1926.1129 is invalid, employers of construction workers who work near coke ovens must follow the provisions of the construction standards as a whole, but do not have to follow the specific standard § 1910.1029, which applies to general industry work.

Because, in effect, the standard does not address construction worker exposures to coke oven emissions, this removal will not reduce the level of protection for workers. To the extent any construction workers would in the future be exposed to coke oven emissions and there is no applicable construction standard that addresses the specific hazard, OSHA could cite the employer under the General Duty Clause (29 U.S.C. 654(a)(1)). After considering these comments, OSHA is proceeding with the removal of § 1926.1129. OSHA is also removing the reference to § 1926.1129 in § 1926.55, Table 1.

13. Additional Revisions to Paragraphs and Appendices in 29 CFR Parts 1910, 1915, and 1926 To Remove Social Security Number Collection Requirements

OMB requires all federal agencies to identify and eliminate unnecessary collection and use of Social Security Numbers (SSN) in agency systems and programs (see Memorandum from Clay Johnson III, Deputy Director for Management, Office of Management and Budget, to the Heads of Executive Departments and Agencies Regarding Safeguarding Against and Responding to the Breach of Personal Identifiable Information (M–07–16), May 22, 2007 (available at: *georgewbush-whitehouse.archives.gov/omb/memoranda/fy2007/m07-16.pdf*)). Recognizing the seriousness of the threat of identity theft and the availability of other methods for tracking employees for research purposes, if needed, OSHA examined

[10] An Administrative Law Judge with the Occupational Safety and Health Review Commission has upheld a citation for violation of § 1926.51(f), requiring washing facilities when construction workers in the regulated area were exposed to coke dust, and a citation for violation of § 1926.59, requiring employers to provide employees with information and training on hazardous chemicals. The Review Commission affirmed the violation of § 1926.51(f) (the other violation was not at issue before the Commission). *McGraw Construction Co, Inc.,* 1991 WL 494789 (No. 89–2220, Jan. 11, 1991) (ALJ Decision), *aff'd in part,* 15 BNA OSHC 2144 (No. 89–2220, Feb. 1, 1993),

the SSN collection requirements in its standards. Based on this review, OSHA proposed in the SIP–IV NPRM removing all requirements in its standards to include employee SSNs on exposure monitoring, medical surveillance, or other records in order to facilitate employers' efforts to safeguard employee privacy. Specifically, OSHA proposed deleting the requirements to include an employee's SSN from 19 standards. The final rule is identical to the proposed rule.

The 19 standards proposed for revision are as follows:

- Hazardous Waste Operations and Emergency Response—§§ 1910.120(f)(8)(ii)(A) and 1926.65(f)(8)(ii)(A);
- Asbestos—§§ 1910.1001(m)(1)(ii)(F), (m)(3)(ii)(A), and appendix D, 1915.1001(n)(2)(ii)(F), (n)(3)(ii)(A), and appendix D, and 1926.1101(n)(2)(ii)(F), (n)(3)(ii)(A), and appendix D;
- Vinyl Chloride—§ 1910.1017(m)(1);
- Inorganic Arsenic—§ 1910.1018(q)(1)(ii)(D) and (q)(2)(ii)(A);
- Lead—§§ 1910.1025(d)(5), (n)(1)(ii)(D), (n)(2)(ii)(A), (n)(3)(ii)(A), and appendix B and 1926.62(d)(5), (n)(1)(ii)(D), (n)(2)(ii)(A), (n)(3)(ii)(A), and appendix B;
- Chromium (VI)—§§ 1910.1026(m)(1)(ii)(F) and (m)(4)(ii)(A), 1915.1026(k)(1)(ii)(F) and (k)(4)(ii)(A), and 1926.1126(k)(1)(ii)(F) and (k)(4)(ii)(A);
- Cadmium—§§ 1910.1027(n)(1)(ii)(B), (n)(3)(ii)(A), and appendix D and 1926.1127(d)(2)(iv), (n)(1)(ii)(B), and (n)(3)(ii)(A);
- Benzene—§ 1910.1028(k)(1)(ii)(D) and (k)(2)(ii)(A);
- Coke Oven Emissions—§ 1910.1029(m)(1)(i)(*a*) and (m)(2)(i)(*a*);
- Bloodborne Pathogens—§ 1910.1030(h)(1)(ii)(A);
- Cotton Dust—§ 1910.1043(k)(1)(ii)(C), (k)(2)(ii)(A) and appendices B–I, B–II, and B–III;
- 1,2 Dibromo-3-Chloropropane—§ 1910.1044(p)(1)(ii)(*d*) and (p)(2)(ii)(*a*);
- Acrylonitrile—§ 1910.1045(q)(2)(ii)(D);
- Ethylene Oxide—§ 1910.1047(k)(2)(ii)(F) and (k)(3)(ii)(A);
- Formaldehyde—§ 1910.1048(o)(1)(vi), (o)(3)(i), (o)(4)(ii)(D), and appendix D;
- Methylenedianiline—§§ 1910.1050(n)(3)(ii)(D), (n)(4)(ii)(A), and (n)(5)(ii)(A) and 1926.60(o)(4)(ii)(F) and (o)(5)(ii)(A);
- 1,3-Butadiene—§ 1910.1051(m)(2)(ii)(F), (m)(4)(ii)(A), and appendix F;
- Methylene Chloride—§ 1910.1052(m)(2)(ii)(F), (m)(2)(iii)(C), (m)(3)(ii)(A), and appendix B;
- Respirable Crystalline Silica—§§ 1910.1053(k)(1)(ii)(G) and (k)(3)(ii)(A) and 1926.1153(j)(1)(ii)(G) and (j)(3)(ii)(A).

OSHA received a total of seven comments in response to this proposal, six of which expressed support for deleting the requirements to include an employee's SSN from the standards mentioned above.

The North American Insulation Manufacturers Association (NAIMA) stated that they ''strongly support'' the deletion of SSN collection requirements ''because inclusion of such information on medical documents compromises employee's personal information and creates a liability scenario for employers.'' The American Foundry Society (AFS) also supported removing the SSN collection requirements from OSHA's standards. AFS stated that there is no justification for including such sensitive information on data sheets or reports that may go to analytical laboratories or be seen by dozens of people in non-secure environments. AFS recommended that employers could instead use the unique employee identification number that employers may use for personnel and other records, which can be linked back to an employee's SSN without compromising security.

The Construction Industry Safety Coalition (CISC) commented that it ''wholeheartedly'' agrees with OSHA's proposal and believes that there are safer and better alternatives than SSNs to identify employees. CISC also supported OSHA's statements in the proposal that employers would not be required to go back and delete employee SSNs from existing records, would not be required to use an alternative unique employee identifier on existing records, and would still be permitted to use SSNs if they wish to do so, and encouraged OSHA to specifically reference these statements in the final rule to clarify employers' responsibilities regarding existing and future records. CISC further recommended that OSHA not mandate a specific type of alternative identification method for employers to use in lieu of SSNs because limiting employers' flexibility to come up with an identification system that works best for their unique situations would be burdensome and difficult to implement.

One commenter, an anonymous public citizen, expressed concern that removing the SSN collection requirements from exposure monitoring and surveillance records would affect employers' ability to identify employees on records. The commenter stated that if employers were required to remove SSNs from existing records, it ''would be daunting and conflict with NARA requirements.'' The commenter also expressed concern that using alternative unique employee identifiers could complicate employer efforts to secure existing records and/or lead to similar employee privacy concerns as those posed by SSNs. OSHA appreciates the commenter's concerns; however, OSHA believes that the seriousness of the threat of identity theft outweighs the concerns raised by the commenter.

After considering these comments, OSHA has decided to remove the SSN collection requirements from the standards listed above, as proposed in the NPRM. Consistent with the proposal, OSHA is not otherwise altering OSHA's requirements for maintaining records, and employers are expected to continue handling previously-generated records that contain SSNs as they currently do. Employers are not required to delete employee SSNs from existing records, nor are employers required to include an alternative unique employee identifier on those records. OSHA is not mandating a specific type of identification method that employers should use on newly-created records, but is instead providing employers with the flexibility to develop a system that best works for their unique situations. Although the revised standards will no longer require it, employers who wish to do so may continue using SSNs on records developed in compliance with the standards noted above. Accordingly, removing the SSN collection requirements will not increase an employer's compliance burden under any of the revised standards.

Additionally, as noted in the proposal, when reviewing forms to remove their SSN collection requirements, OSHA noticed that several forms from older standards do not comport with OMB's Standards for Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity, as updated on October 30, 1997 (62 FR 58782–58790). OSHA thus explained that it was considering revising those forms to either update the language to ensure compliance with OMB's standards or remove the question altogether. The final rule makes those revisions to comply with OMB standards. The final rule also effects a minor change to a question in a general industry Cadmium standard questionnaire.

As one example from the proposal, Part 1 (''Initial Medical Questionnaire'') of appendix D of the asbestos standard for general industry (29 CFR 1910.1001)

includes a question (currently #15) that states:

Race:
1. White ____
2. Black ____
3. Asian ____
4. Hispanic ____
5. Indian ____
6. Other ____

To reflect a combined race and ethnicity format (see 62 FR 58782, 58789), OSHA proposed revising the language to state:

Race:
1. White ____
2. Black or African American ____
3. Asian ____
4. Hispanic or Latino
5. American Indian or Alaska Native ____
6. Native Hawaiian or Other Pacific Islander ____

OSHA requested comments on whether it should revise the forms in this manner, and whether doing so would impose any additional burden hours or costs on employers.

The agency only received one comment on this issue. NIOSH recommended that OSHA continue to collect race and ethnicity information in compliance with the Office of Management and Budget's (OMB) standards. NIOSH stated that, in some cases, this information may be necessary to choose the correct reference equation for interpretation of spirometry results, and that possessing this information may also be useful for documenting disparities. NIOSH suggested that OSHA provide instructions to those who provide information using the combined format that they should check all categories that apply to them, since race and ethnicity are not mutually exclusive, and many Americans have mixed racial and ethnic backgrounds. NIOSH also pointed out that OMB's standards combine ''Native Hawaiian or Other Pacific Islander'' into a single category and does not separate them, as OSHA appeared to do in the proposal. OSHA did not propose to separate those two categories; it only appeared that way due to the spacing in the proposal.

After considering this comment, OSHA has decided to revise its older forms to use a combined race and ethnicity format, as demonstrated above for Part 1 (''Initial Medical Questionnaire'') of appendix D of the asbestos standard for general industry (29 CFR 1910.1001), in order to bring the forms into compliance with OMB's standards. The following forms, which are also impacted by the removal of SSN collection requirements, will be revised to use the combined race and ethnicity format: Asbestos Standard for General Industry (§ 1910.1001, appendix D), Construction (§ 1926.1101, appendix D), and Maritime (§ 1915.1001, appendix D); Cotton Dust (§ 1910.1043, appendix B–1, appendix B–II, and appendix B–III); and Methylene Chloride (§ 1910.1052, appendix B). OSHA is accepting NIOSH's recommendation to adhere to the OMB's Standards and is inserting a ''Check all that apply'' instruction to all the forms that are impacted.

Additionally, when reviewing forms to remove their SSN collection requirements, OSHA noticed that appendix D of the general industry Cadmium standard (§ 1910.1027) asked workers, ''35. Have you or your partner ever conceived a child resulting in a miscarriage, still birth or deformed offspring?'' OSHA recognizes that the phrasing of the last condition was insensitive and not medically accurate. Therefore, OSHA is rephrasing that question to read, ''35. Have you or your partner ever conceived a child resulting in a miscarriage, still birth or child with malformations or birth defects?''

C. Proposed Revisions Not Being Finalized Today

Subpart J of Part 1910—General Environmental Controls, Control of Hazardous Energy (Lockout/Tagout) in 29 CFR 1910.147

OSHA proposed making changes to subpart J of part 1910—General Environmental Controls, The control of hazardous energy (lockout/tagout) in 29 CFR 1910.147. According to its terms, the lockout/tagout standard applies to servicing and maintenance operations ''in which the *unexpected* energization or startup of the machines or equipment, or the release of stored energy could cause injury to employees'' (§ 1910.147(a)(1)(i) (emphasis in original)). Because OSHA believes the word ''unexpected'' has been misinterpreted to exclude some operations where employees are subject to injury from startup or the release of stored energy, the agency proposed removing the word ''unexpected'' from § 1910.147(a)(1) and several other places it appears in the standard.

OSHA made this proposal as a result of a ruling made by the Occupational Safety and Health Review Commission (OSHRC), which was affirmed by the United States Court of Appeals for the Sixth Circuit. *Reich* v. *General Motors Corp., Delco Chassis Div.* (GMC Delco), 17 BNA OSHC 1217 (Nos. 91–2973, 91–3116, 91–3117, 1995); aff'd 89 F.3d 313 (6th Cir. 1996). Those decisions found that the lockout/tagout standard did not apply where a startup procedure for a machine provided a warning to a worker servicing it that it was about to start. In that case, workers were servicing machines that used an eight-to-twelve-step startup procedure, including time delays, and audible or visual warnings. The court and OSHRC held that, because these features would warn the servicing employees that the machines were about to start, the startup would not be ''unexpected.'' OSHA believes that the *GMC Delco* decisions misconstrued the ''unexpected'' language of the lockout/tagout standard by allowing employers to use warning and delay systems as alternatives to following the requirements of the standard.

OSHA received about 155 comments on this issue, though many were submitted as part of a mass mailing campaign. All but seven of the comments opposed removing the word ''unexpected.''

As an example, Davies Molding, LCC, a firm that makes moldings, commented (as part of a mass mail campaign) that:

> This proposed rule would adversely impact a company's ability to utilize certain advances in technology such as automated controls that can eliminate the potential for unexpected energization and therefore eliminate the need for LOTO. It also contradicts recent legal precedent (Reich v. General Motors Corp., Delco Chassis Div., GMC Delco). In removing the ability of employers to demonstrate the absence of exposure to unexpected energization, lockout would become a requirement for all energy sources. . . . Regulatory certainty is strongly desired, but not every machine is the same and a singular, generic fix applied to all equipment is not the solution. OSHA's LOTO rule (29 CFR 1910.147) is complex and outdated. A better solution to concerns about LOTO and the scope of requirements around energization is for OSHA to move forward with its plans to review and potentially update the entire rule in a complete and independent rulemaking. OSHA has noted review of technological advancements with computer-based controls, greater acceptance of such methods internationally, increased requests for variances for these devices, the utility of understanding new technology and potential hazards to workers, and the appropriateness of a potential rulemaking process is necessary.

(OSHA–2012–0007–0581).

Apogee Designs, a manufacturer, commented:

> Removing ''unexpected'' from the term ''unexpected energization'' broadens the scope of the rule adding only confusion to what is already understood and implemented. We agree with the Plastics Industry Association (PIA) in that OSHA should pursue a separate rule relating to 29 CFR 1910.147 that would NOT adversely impact automated controls that eliminate

potential unexpected energization. . . . If changes are made to the LOTO rule they should be reviewed in their totality in the context of modern manufacturing techniques and technology. Much has been said of 'Advanced Manufacturing' and its ability to provide jobs for employees and opportunities for firms who wish to embrace what is no longer the future but is 'the now'. We submit that OSHA focus on how to minimize risk of personnel harm without placing undue burden on employees, companies, and regulators. It is not possible to eliminate accidents, it is possible to minimize their impact.

(OSHA–2012–0007–0733).

The American National Standards Institute Accredited Z244 Committee for the Control of Hazardous Energy—Lockout, Tagout and Alternative Methods also commented that the removal of the word ''unexpected'' would be inconsistent with its standard ANSI/ASSE Z244.1 (OSHA–2012–0007–0714).

In favor of removal, the AFL–CIO commented:

This decision [*GMC Delco*] totally undermines the original intent of the standard and allows warning systems to be used instead of following the requirements of the standard. As OSHA points out in the preamble of the proposed rule, the exclusive use of warning systems subverts the intent of the standard by removing the control of the hazardous energy from the individual authorized employee and instead placing the burden on exposed employees to recognize warnings so they can escape danger zones . . . . Moreover, this decision requires OSHA to make a case-by-case determination of whether or not such warning systems provide adequate and reliable warnings to workers again undermining the application of the rule and the protection of workers. . . . .

If OSHA choses[sic] to maintain the term ''unexpected'' in the standard, we urge OSHA to include a definition of the term ''unexpected'' in the final version of this rule similar to the definition that is included in the OSHA Lockout-Tagout compliance directive. That directive states that ''the term unexpected refers to any energization or start-up that is not sanctioned (through the removal of personal LOTO devices) by each authorized employee engaged in the servicing and maintenance activity.'' (CPL 02–00–147)

(OSHA–2012–0007–0761).

OSHA continues to believe that the GMC Delco decisions misconstrued the ''unexpected'' language of the lockout/tagout standard. However, OSHA also acknowledges the overwhelming opposition to this change and agrees with the many comments that cited complications with this issue due to technological advancements. Further, the AFL–CIO included in its comment a proposal of a path OSHA could follow to uphold the rigor of the proposed rule. In light of the information provided by the comments, OSHA is not in a position at this time to make a final decision on this issue. As a result, the agency will not finalize its proposal to remove the word ''unexpected'' from the control of hazardous energy standard but will further consider this issue in light of the overall standard.

Subpart E of Part 1926—Personal Protective and Life Saving Equipment, Criteria for Personal Protective Equipment in 29 CFR 1926.95

Section 1926.95 sets out the requirements for personal protective equipment (PPE) in construction. In the NPRM, OSHA proposed to revise this standard to explicitly require that PPE used in construction properly fit each affected worker.

OSHA received four comments on this proposal. The Laborers' Health & Safety Fund of North America (LHSFNA) and North America's Building Trades Unions (NABTU) both supported the revision (OSHA–2012–0007–0757, –0742). A third comment from a safety professional supported the revision, but mentioned ''significant concerns'' that ''need to be addressed'' before finalizing the proposal (OSHA–2012–0007–0696). The comment characterized the change as a ''difficult'' and ''bold step'' with definite compliance challenges. A fourth comment, from the Construction Industry Safety Coalition (CISC), opposed the revision (OSHA–2012–0007–0753). CISC, made up of 25 trade associations, stated that ensuring that PPE properly fits all affected workers in construction would impose significant additional obligations. CISC commented in particular that explicitly requiring employers to ensure that all PPE properly fits would greatly change the standard and place new responsibilities on employers, and warrants a more fulsome rulemaking process than that offered in the SIP–IV rulemaking.

The purpose of SIP–IV is to remove or revise outdated, duplicative, unnecessary, and inconsistent requirements in OSHA's safety and health standards. Given that limited purpose and the comments described above, OSHA is not finalizing the proposal in this rulemaking. Instead, OSHA has determined that such a change to the PPE standard should occur in a separate rulemaking outside the limited SIP process. OSHA anticipates that this approach would provide the public with broader notice of the proposal, encourage robust commentary, and better inform OSHA's approach to employer obligations and worker safety in relation to PPE used in construction.

Subpart P of Part 1926—Excavations, Specific Excavation Requirements in 29 CFR 1926.651

Paragraphs (j)(1) and (2) of § 1926.651 specify requirements for employers to protect employees from (1) loose rock or soil in excavations, and (2) excavated or other materials or equipment that could fall or roll into an excavation. Similar provisions were part of OSHA's subpart P Excavation standard originally issued under the Construction Safety Act in 1971 as 29 CFR 1518.651(h) and (i) (36 FR 7340, 7389, April 17, 1971), and OSHA retained them when it revised the standard in 1989 (54 FR 45894, Oct. 31, 1989). The original 1971 standard placed the burden on employers to ensure employees' safety from loose rock and soil, and excavated or other materials, in or around excavations (36 FR 7340, 7389). The 1989 revision added to the paragraphs (j)(1) and (2) the phrase ''that could pose a hazard'' when referring to loose rock or soil and excavated or other materials or equipment (54 FR 45894, 45924–45925).

In the SIP–IV NPRM, OSHA proposed to remove the phrase ''that could pose a hazard'' from both paragraphs to help clarify that the burden is on the employer to ensure employees' safety from loose rock and soil, and excavated or other materials, in or around excavations, and that OSHA does not have to establish that loose rock or soil or excavated or other material or equipment poses a hazard to employees before it can establish a violation of § 1926.651(j)(1) and (2).

OSHA received six comments on this proposed change. The Laborers' Health & Safety Fund of North America (LHSFNA) and the North American Building Trades Union (NABTU) both supported this revision, both stating that spoil piles pose a recognized hazard (OSHA–2012–0007–0742, –0757).

Emmanuel Omeike, a safety professional, commented that this proposal is unnecessary and does not address the ongoing hazards and high rates of injuries and fatalities due to excavation work. He argued that the excavations standard is already comprehensive enough, and OSHA should focus on enforcing the current standard (OSHA–2012–0007–0696).

The National Utility Contractors Association (NUCA) and Construction Industry Safety Coalition (CISC) both expressed opposition to this revision (OSHA–2012–0007–0654, –0753). Both argued that the 1989 revision to the Excavation standard did make a substantive change to the standard,

which was OSHA's intent when it clarified the standard. They also argued that the existing language recognizes that loose rock or soil or excavated or other material or equipment do not always pose a hazard to employees, and it clearly informs employers that they must protect employees from loose rock or soil or excavated or other material or equipment when it does pose a hazard.

The National Association of Homebuilders (OSHA–2012–007–0747) joined in the CISC comment, and also recommended that OSHA revise the excavations standard to add the work practices that are outlined in the OSHA memorandum ''Suspension of 29 CFR 1926.652 to House Foundations/Basement Excavations'' for protecting house foundation/basement excavations in either SIP–IV or a separate rulemaking. That recommendation is beyond the scope of SIP–IV.

In the SIP–IV NPRM, OSHA also proposed removing the language ''by falling or rolling from an'' from § 1926.651(j)(1) because that language is unnecessary while retaining the term ''excavation face'' in the provision. NUCA opposed the removal of this language for the same reasons it opposed the removal of ''that could pose a hazard'' (OSHA–2012–0007–0654).

After considering these comments, OSHA has decided that it needs to further consider the possible removal of the phrase ''that could pose a hazard'' from § 1926.651(j)(1) and (2) and the language ''by falling or rolling from an'' from § 1926.651(j)(1). As a result, OSHA is not making any changes to these two provisions in this final rule.

Subpart S in Part 1926—Underground Construction, Caissons, Cofferdams and Compressed Air, Compressed Air in 29 CFR 1926.803

OSHA proposed to revise subpart S—Underground Construction, Caissons, Cofferdams, and Compressed Air, by replacing the decompression tables currently found in appendix A to subpart S with the 1992 French Air and Oxygen decompression tables (French). OSHA also requested comment on whether the following decompression tables should also be permitted as substitutes for the existing tables in appendix A: The Edel-Kindwall (NIOSH) tables, the Blackpool (British) tables, and the German Standard Decompression (German) tables. After reviewing the comments, discussed below, OSHA has determined that while the decompression tables need to be updated, SIP–IV is not the appropriate mechanism to carry out a broader update of subpart S. In addition to the decompression tables, subpart S, as it relates to decompression, needs to be updated in its entirety. The agency considered the effect of only updating the tables, as proposed, but has determined they would conflict with and not solve other problems with the current standard. A full explanation of the proposal and discussion of the decompression tables is found at 81 FR 68503, 68520.

OSHA received three comments, each offering support for the use of the French tables. The Laborers' Health & Safety Fund of North America (LHSFNA) and the North American Building Trades Union (NABTU) stated they are ''glad to see OSHA's proposal to update this standard and adopt the French tables, which can also be used for oxygen decompression and at pressures higher than those in the original OSHA standard'' (OSHA–2012–0007–0757 and OSHA–2012–0007–0742). This comment highlights the difficulty with only updating the tables without updating other parts of the standard. While the French tables are designed to be used at higher pressures and for oxygen decompression, OSHA did not propose in SIP–IV to revise the parts of subpart S that limit the amount of pressure an employee can be subjected to or limit the use of oxygen. OSHA believes that only updating the decompression tables, without updating other parts of the standard, would lead employers to believe they can use parts of the French tables that would violate the current standard. Both commenters also requested that contractors be given the option to use the British, Edel-Kindwall, German, or Navy tables. As part of further study of this issue, OSHA will continue to consider which tables are acceptable for use in underground construction.

OSHA also received a comment from the National Institute for Occupational Safety and Health (NIOSH) that supported the updating of the decompression standard in a manner that goes beyond the scope of the proposed rule. NIOSH recommended that OSHA take the following steps when updating the decompression tables: ''[r]equire staged decompression, allow 100 percent oxygen use during decompression, vary the decompression schedule based on exposure time, and allow for greater pressures in underground construction projects'' (OSHA–2012–0007–0726). NIOSH also recommended that OSHA adopt the Edel-Kindwall tables, and noted that additional decompression tables exist. Finally NIOSH agreed that the standard would need to be updated if an oxygen-based set of decompression tables were selected.

Each of the comments were supportive of OSHA's efforts to update the decompression standard, including the tables. However, each of the comments highlighted the challenges and problems that present themselves by only updating to the French tables (or any of the tables discussed). OSHA agrees that the limitations on pressure and the use of oxygen in the current standard are not compatible with any of the modern decompression tables. OSHA acknowledges that these issues were discussed in the proposed rule, but has determined that SIP–IV is not the appropriate mechanism to update subpart S. While OSHA is not updating the tables in this rulemaking as proposed, the agency is considering how to best move forward with updating the decompression standard. The proposed revisions to 29 CFR 1926.803(f)(1) and appendix A to subpart S are not being finalized.

IV. Final Economic Analysis and Final Regulatory Flexibility Act Analysis

Executive Orders 12866 and 13563 require that OSHA estimate the benefits, costs, and net benefits of regulations. Executive Orders 12866 and 13563, the Regulatory Flexibility Act (5 U.S.C. 601–612), and the Unfunded Mandates Reform Act (UMRA) (2 U.S.C. 1532(a)) also require OSHA to estimate the costs, assess the benefits, and analyze the impacts of certain rules that the agency promulgates. Executive Order 13563 emphasizes the importance of quantifying both costs and benefits, reducing costs, harmonizing rules, and promoting flexibility.

This rule is not an ''economically significant regulatory action'' under Executive Order 12866 or UMRA, and it is not a ''major rule'' under the Congressional Review Act (5 U.S.C. 801 *et seq.*). The expected total cost savings per year are $6,066,000. Given that these are all annual cost savings, the final estimate is the same when discounted at either 3 or 7 percent. For the same reason, when the Department uses a perpetual time horizon to allow for cost comparisons under E.O. 13771, the annualized cost savings of the final rule are also $6,066,000 with 7 percent discounting. This rule has estimated annual costs of $32,440 and will lead to approximately $6.1 million per year in cost savings to regulated entities. Thus, neither the benefits nor the costs of this rule exceed $100 million. In addition, it does not meet any of the other criteria specified by UMRA or the Congressional Review Act for a significant regulatory action or major rule. This Final Economic Analysis (FEA) addresses the

costs, cost savings and benefits of this rule.

Work-Related Hearing Loss

OSHA is adding a specific cross-reference to 29 CFR 1904.5—Determination of Work-Relatedness, in § 1904.10—Recording Criteria for Cases Involving Occupational Hearing Loss, paragraph (b)(6). This cross-reference clarifies that employers must comply with the provisions of § 1904.5 when making a determination as to whether a worker's hearing loss is work-related. This clarification does not change any of the requirements in 29 CFR 1904.10. In the Preliminary Economic Analysis (PEA), OSHA determined that neither new costs nor compliance burdens would result from adding the cross-reference to an existing standard. As discussed in the Summary and Explanation of the Final Rule (Summary and Explanation), while some commenters, such as the Construction Industry Safety Coalition (OSHA–2012–0007–0753), expressed concern that the proposed language may increase their required reporting of hearing loss cases, the agency explained in detail in that section why this clarification does not impose any new obligations on employers.[11] With that in mind, OSHA retains its assessment from the PEA that this provision does not impose new costs on employers.

Chest X-Ray Requirements

Medical surveillance requirements in health standards are designed primarily to detect the early onset of adverse health effects so that appropriate interventions can be taken. In certain OSHA standards, the agency currently requires periodic chest X-rays (CXRs) as a form of early lung cancer detection. At the time these standards were promulgated, routine screening for lung cancer with CXR was considered appropriate; however, recent studies with many years of follow-up have not shown a benefit from CXR screening for either lung cancer incidence or mortality. As a result, OSHA is removing the requirement for periodic CXR in the following standards: §§ 1910.1029—Coke Oven Emissions, 1910.1045—Acrylonitrile, and 1910.1018—Inorganic Arsenic.

As OSHA has become increasingly aware of the ineffectiveness of CXR in reducing lung cancer mortality, the agency has moved to decrease CXR requirements to eliminate unnecessary radiation to workers as well as reduce the cost to employers to provide CXR as part of medical examinations. OSHA previously reduced the frequency of CXRs for workers covered by the arsenic and coke oven emissions standards in the first phase of the Standards Improvement Process (63 FR 33450, June 18, 1998). Not only does OSHA conclude that the removal of this requirement will result in a cost savings to employers, but the agency also believes it will prove to be beneficial to employees by decreasing their exposure to radiation as well as decreasing the rate of false positive results. OSHA has not attempted to quantify these benefits in this final analysis.

To estimate the annual cost savings to employers for removing the requirement for periodic CXRs from the listed standards, OSHA, with the assistance of Eastern Research Group (ERG), estimated the number of unnecessary CXRs that will be eliminated by this change by drawing on estimates of the affected number of workers for each standard addressed in the agency's recent Information Collection Requests (ERG, 2017b). The numbers presented in this FEA have been revised from the PEA to reflect the most recent wage, price and industry profile data. These changes are demonstrated in the SIPS–IV Cost Benefits Estimates spreadsheet (OSHA, 2018).[12] OSHA then analyzed data from the Centers for Medicare and Medicaid Services' (CMS) Physician Fee Schedule. Summary CMS survey data from across the United States indicated a national average price of $73.11 per CXR (ERG, 2017a).[13] Finally, the agency multiplied the average price of a CXR by the number of CXRs to be eliminated, providing an estimate of $265,326 of exam cost savings. This information is detailed as follows:

Coke Oven Emissions (§ 1910.1029):
  Reduced Exam Costs: 2,498 exams × $73.11 CXR cost per exam = $182,636
Acrylonitrile (§ 1910.1045):
  Reduced Exam Costs: 542 exams × $73.11 CXR cost per exam = $39,627
Inorganic Arsenic (§ 1910.1018):
  Reduced Exam Costs: 589 exams × $73.11 CXR cost per exam = $43,063
Total Reduced Exam Cost:
  $182,636 + $39,627 + $43,063 = $265,326

Reducing the time of the medical exam, by removing the CXR requirement, also saves employers money because the employee is away from work for a shorter period of time. Based on information from *RadiologyInfo.org,* the agency conservatively estimates that the time employees will be away from work is reduced by 15 minutes when the CXR component of the exam is eliminated (ERG, 2017a). As indicated below, OSHA estimates this change will save 907 hours of worker time that would have been spent during their recurring exams.

For the calculation of labor-related cost savings for this FEA, OSHA included an overhead rate when estimating the marginal cost of labor in its primary cost calculation. Overhead costs are indirect expenses that cannot be tied to producing a specific product or service. Common examples include rent, utilities, and office equipment. Unfortunately, there is no general consensus on the cost elements that fit this definition. The lack of a common definition has led to a wide range of overhead estimates. Consequently, the treatment of overhead costs needs to be case-specific. OSHA adopted an overhead rate of 17 percent of base wages. This is consistent with the overhead rate used for sensitivity analyses in the 2017 Improved Tracking of Workplace Injuries and Illnesses FEA and the FEA in support of OSHA's 2016 final standard on Occupational Exposure to Respirable Crystalline Silica. For example, to calculate the total labor cost for production work related medical exams for production operator (SOC: 51–000), three components are added together: Base wage ($18.30) + fringe benefits ($8.49, 46% of $18.30)[14] + applicable overhead

[11] OSHA has conducted a sensitivity analysis on the hypothetical assumption that the clarification will assist some employers' compliance with their hearing-loss reporting obligations. For instance, in 2016 BLS reported 100 cases of hearing loss for the entire construction industry, or 0.2 per 10,000 workers; however, hearing loss across all industries was much higher, at 1.7 per 10,000 workers (BLS, 2017a). If the construction industry were to report hearing loss at a rate of 2.0 per 10,000 workers—similar to other industries—then it would be reporting an additional 900 hearing-loss cases. The average case costs $57, so that would result in total additional costs of $51,300 ($57 × 900). OSHA assumes that, across all industries, the clarification may result in a 10% increase in reported hearing-loss cases (with much of that overall increase coming from the construction industry). This modest 10% increase is based on the assumption that the regulation's hearing-loss reporting requirement is already clear to nearly all employers. A 10% increase would result in additional costs of $107,700 (18,900 total cases in 2016 × 10% × $57 per case) (BLS, 2017a). (The $57-per-case estimate is based on the estimated labor costs divided by the total number of cases reported to BLS (OSHA, 2018a)).

[12] In addition, note that the totals in tables in this chapter, as well as totals summarized in the text, may not precisely sum from underlying elements due to rounding. The precise calculation of the numbers in the FEA appears in the spreadsheet.

[13] Exam cost adjusted from PEA to 2017 dollars using the GDP deflator as indicated in the SIP–IV Cost Benefits Estimates spreadsheet (OSHA, 2018).

[14] Wages are based on data from the May 2017 National Occupational Employment and Wage Estimates for Standard Occupational Classification Code 51–000—Production Operation (BLS, 2017), which lists average base compensation of $18.30. A private industry Fringe Benefit rate of 31.70 percent was from Source: Bureau of Labor Statistics.

costs ($3.11, 17% of $18.30). This increases the labor cost of the fully-loaded wage (including overhead) for a production worker to $29.90.

Multiplying the reduced exam time by the fully-loaded employee hourly wages of $29.90, the agency estimates a cost savings of $27,131. This information is detailed as follows:

Coke Oven Emissions (§ 1910.1029):
Time saved: 2,498 exams × .25 hours = 625 hours [15]
Reduced Cost: 625 hours × ($26.79 employee compensation + $3.11 overhead) = $18,675
Acrylonitrile (§ 1910.1045):
Time saved: 542 exams × .25 hours = 136 hours
Reduced Cost: 136 hours × ($26.79 employee compensation + $3.11 overhead) = $4,052
Inorganic Arsenic (§ 1910.1018):
Time saved: 589 exams × .25 hours = 147 hours
Reduced Cost: 147 hours × ($26.79 employee compensation + $3.11 overhead) = $4,403
Total Employee Time Savings from fewer CXRs:
625 hours + 136 hours + 147 hours = 907 hours
Total Value of Time Savings plus Overhead from fewer CXRs:
$18,675 + $4,052 + $4,403 = $27,131

Combining the value of saved worker time and overhead of $27,131 with the decreased exam cost of $265,326 nets a total potential cost savings to employers of approximately $292,500. OSHA did not receive comments questioning the estimates of the cost savings, as presented in the PEA.[16]

In addition to removing the requirement for periodic CXR, OSHA is updating other CXR requirements in its coke oven emissions, acrylonitrile, and inorganic arsenic standards, as well as in its three Asbestos standards—§§ 1910.1001 asbestos (General Industry), 1915.1001 Asbestos (Maritime), and 1926.1101 Asbestos (Construction)—and two cadmium standards—§§ 1910.1027 Cadmium (General Industry) and 1926.1127 Cadmium (Construction).

In recent years, innovation in medical technology has allowed for screening with digital CXRs. Reflecting this, OSHA is adding the option of digital radiography to its existing standards. As a practical matter, digital radiography systems are rapidly replacing traditional analog film-based systems in medical facilities.

There are cost savings to using digital CXRs over analog CXRs. Traditional analog film-based CXRs are much larger than standard-sized office documents and weigh more than a piece of paper of the same size. As such, storing traditional CXRs requires an investment in specialized storage cabinets, which in turn may require reinforcement of the floor. Digital CXRs, however, can be stored on a computer. Due to continuing advances in technology and the emergence of inexpensive and large-capacity storage devices, digital CXRs can be stored for just a fraction of a cent each. Digital CXRs also save time and materials because they can be instantly processed and ready for use as soon as the CXR is taken.

OSHA believes that digital storage of CXRs is so common that most employers are already realizing these cost savings and will thus not incur any additional savings as a result of this change. As a practical matter, OSHA already allows digital storage of CXRs. In a letter of interpretation released on September 24, 2012, entitled ''OSHA's Position on the Acceptability of Digital Radiography in Place of Traditional Chest Roentgenograms,'' OSHA stated: ''OSHA would allow, but would not require, digital radiography in place of traditional chest roentgenograms for medical surveillance exams under the asbestos standards for general industry, construction, and shipyards.'' [17] Although OSHA has not released interpretations specifically allowing for digital storage of CXRs in other standards, it has become the agency's practice not to cite or otherwise penalize employers for storing CXRs digitally. Because it is now current OSHA enforcement practice to waive the formal requirement for employers to keep analog copies of CXRs when they store them digitally, the agency concludes that there is no realized cost savings by changing this requirement. Even so, OSHA also believes that employers will benefit from the certainty that comes only from codified regulation. Employers can now rely on the regulatory text rather than agency discretion.

Revisions in these standards also include replacements of antiquated terminology such as ''roentgenogram,'' correction of misspellings in the existing standards, an update to the current ILO classification guidance, and revisions where inaccuracies exist in clinical diagnostic language. OSHA is updating the regulatory text to better distinguish between the appropriate uses of ''classification'' and ''interpretation'' of CXRs. As indicated in the PEA, the agency believes these changes are merely editorial in nature and reflect current practices, and therefore do not create new costs or cost savings for employers. As discussed in the Summary and Explanation, while commenters generally approved of the changes OSHA was proposing, the agency did not receive comments questioning the PEA's conclusions.

Cotton Dust

As explained in greater detail in the Summary and Explanation, OSHA is making revisions to its medical surveillance program requirements—more specifically, its pulmonary function testing requirements of the cotton dust standard (29 CFR 1910.1043). Exposure to cotton dust places employees at risk of developing the respiratory disease byssinosis. Since the publication of the cotton dust standard in 1978, OSHA has not updated its pulmonary function testing requirements to match those of current technology and practices. As a result, OSHA in the proposal based the proposed revisions on current recommendations from organizations recognized as authorities on generally accepted practices in pulmonary-function testing: ATS/ERS, NIOSH, and ACOEM.

OSHA is revising paragraph (h) and appendix D of its Cotton Dust standard. Many of the revisions are simply editorial, to clarify existing language, as well as to update pulmonary function measurements. However, for those revisions that may suggest a potential need to upgrade pulmonary testing equipment, OSHA investigated the characteristics of equipment currently available in the United States and whether such equipment met the specifications of OSHA's revisions.

Paragraphs (h)(2)(iii) and (h)(3)(ii)(A) and (B) give instructions for pulmonary function testing, measuring Forced Vital Capacity (FVC) and Forced Expiratory Volume in One second (FEV_1) against the Spirometry Prediction Tables for Normal Males and Females (former appendix C), adjusting those measurements based on ethnicity, and from the outcome of such measurements, determining the frequency of medical surveillance provided to employees. OSHA is

Employer Costs for Employee Compensation (BLS 2018). The multiplier applied to base compensation to determine loaded wages is 1.46 [1/(1 − 31.70 percent)]. Applying the multiplier (1.46) to base compensation ($18.30) results in loaded wages of $26.79.

[15] Numbers rounded to the nearest whole number here and elsewhere for presentation in the Final Economic Analysis. See also fn. 9.

[16] The overhead component was not included in the PEA, but has been added to the FEA in fulfillment of Department of Labor policy.

[17] U.S. Dept. of Labor, OSHA, Standard Interpretations. Asbestos standards, Sept. 24, 2012, *www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=28583* (accessed November 24, 2017).

revising this provision to specify use of the National Health and Nutrition Examination Survey (NHANES) III reference data set and to replace the values currently in appendix C with the NHANES III values.

Software for most spirometers includes the NHANES III data set, which is identified as the Hankinson data set on some spirometers. If software for older spirometers does not include the NHANES III data set, users of those spirometers will be able to access the NHANES III values online through the NIOSH calculator. Tables of the NHANES III values are also available online in an appendix of OSHA's spirometry guidance for healthcare professionals. Therefore, NHANES III values are widely available to spirometry providers, including those providers using older spirometers.

OSHA's use of the NHANES III data set in place of the Knudson values currently in appendix C simplifies interpretation of spirometry results by providing reference values for more race/ethnic groups, thereby reducing the need to adjust values for race/ethnic groups not included in the Knudson data set. This revision as to how pulmonary functioning should be tested and measured falls in line with current generally accepted practices; therefore OSHA does not believe this revision will pose a compliance burden to affected employers.

OSHA is also updating paragraph (h)(2)(iii) to require an evaluation of FEV_1, FVC, and FEV_1/FVC against the lower limit of normal (LLN) for each race/ethnic group, by age. Modern spirometers typically provide this information automatically, and no one in the record argued that this provision would have costs. Similarly, OSHA has decided that the basis for frequency of medical surveillance in paragraphs (h)(3)(ii)(A) and (B) is whether the FEV_1 is above or below the LLN. This technically changes the required triggers for medical surveillance from the existing standard, but is consistent with generally accepted current practices. The agency believes the changes will reduce confusion and have little other practical effect. The revision to evaluate the FEV_1/FVC ratio in addition to FEV_1 and FVC does not affect the triggers for other medical monitoring requirements such as changes in medical-surveillance frequency or referral for a detailed pulmonary examination because the standard bases those triggers solely on FEV_1 values.

Revisions to appendix D address updates to the specifications of spirometry equipment used in performing pulmonary functioning tests. To assess whether current readily available spirometry equipment met the agency's specifications, OSHA investigated the market for spirometry equipment, with the assistance of a contractor, Eastern Research Group (ERG). OSHA found that the market has been adapting to similar consensus standards in this area since as far back as 1994. In its research of spirometry product specifications collected through internet searches, interviews with manufacturers, and the consultation of peer-reviewed literature and voluntary standards published by respiratory health groups, the agency found that spirometry models currently sold in the United States, Europe, and Australia meet the specification revisions of spirometry equipment to be used in the cotton dust standard. Upon further investigation, ERG determined that out of a sample of 12 spirometry models from various manufacturers, 11 models were already compliant with the volume, accuracy, and minimum duration requirements of the 2005 spirometry specification standard jointly published by ATS/ERS (ERG, 2017a).

The agency estimates that spirometry equipment has a working life of approximately ten years. To prevent a potential burden to employers from having to prematurely purchase new equipment, OSHA is allowing the revised spirometry specifications to apply only to equipment newly purchased one year or more after the date of publication of this final standard in the **Federal Register**. Combined with evidence that the large majority of the equipment already on the market is already compliant, OSHA preliminarily concluded that the revisions to the spirometry equipment specifications would not impose additional costs or compliance burdens to employers. OSHA received no comments indicating substantial costs from these requirements, and therefore stands by its preliminary conclusions.

Shipyard Employment: Feral Cats

As stated in the Summary and Explanation, OSHA is removing feral cats from its definition of ''vermin'' in paragraph (b)(33) of § 1915.80—subpart F—Shipyard General Working Conditions. 29 CFR 1915.88—Sanitation, paragraphs (j)(1) and (2), specify that employers must, to the extent reasonably practicable, clean and maintain workplaces in a manner that prevents vermin infestation. When employers detect vermin, they must implement and maintain an effective vermin-control program.

OSHA has determined that, although the possibility exists for feral cats to pose safety and health hazards for employees, the threat is minor as the cats tend to avoid human contact. Further, stakeholders and commenters (as discussed in the Summary and Explanation) have expressed concern that including the term ''feral cats'' in the definition of ''vermin'' encourages cruel and unnecessary extermination. OSHA does not believe that removing the term ''feral cats'' from the definition will reduce worker health and safety, and notes that feral cats may help reduce the presence of other vermin. To the extent feral cats pose a safety or health hazard at any particular shipyard, OSHA would consider the cats to be ''other animals'' under the standard. Removing a perceived obligation to exterminate feral cats does not have any costs to employers; if there is an economic effect, it would be a potential cost savings to the extent that anyone is now exterminating feral cats on the basis of that perceived obligation.

911 Emergency Medical Services

OSHA is revising paragraph (f) in 29 CFR 1926.50—Medical Services and First Aid. Existing § 1926.50(e) requires employers to provide a communication system for contacting ambulance service, or proper equipment for transportation of an injured person. Existing § 1926.50(f) requires the posting of telephone numbers of physicians, hospitals, or ambulances for work sites located in areas where 911 emergency service is not available. OSHA is retaining both of these requirements. The agency will add to paragraph (f) a requirement that when an employer uses a communication system for contacting 911 services, the employer must ensure that the communication system can effectively do so, and, if the system is in an area that does not automatically supply the caller's latitude and longitude to the 911 dispatcher, post or otherwise provide to employees the latitude and longitude of the work site or other information that communicates the location of the worksite.

OSHA has concluded that this requirement will result in annual costs of $32,440 until 2019, when the FCC expects enhanced 911 wireless services to be universal, at which time these costs would disappear.

OSHA calculated the burden hours and wage hour costs for employers to post the latitude and longitude of the work site location based on the number of new construction projects started in a given year. To estimate the number of project sites, OSHA reviewed the most

recent data provided by request from Dodge Data and Analytics.[18] The Dodge data show a total of 891,712 new construction project starts in 2016, of which 766,133 were residential buildings, 68,589 were non-residential buildings, and 56,990 were non-buildings. Of the 766,133 residential buildings, 735,745 were single-family homes, 9,084 were two-family houses, and 21,304 were apartments.[19]

OSHA notes that more than one single-family home may be built at a project site. The agency determined that construction contractors build approximately one-half of single-family houses at single house project sites and the other half at project sites holding multiple single-family homes. As a result, OSHA estimated the number of single-family homes completed at single house project sites in 2016 to be 367,873, and 183,936 to be the total of project sites holding two single family-homes (one-half of single-family houses at single project sites: 735,745/2 = 367,873; one-half of single-family homes at project sites holding two houses: 367,873/2 = 183,936). As shown below in Table IV–1, the total number of construction project sites covered by this provision is: 707,776.

TABLE IV–1—ESTIMATED TOTAL CONSTRUCTION SITES IN THE UNITED STATES, 2016

Type of construction site	Total number of construction projects
Non-Residential Buildings	68,589
Non-Buildings Construction Projects	56,990
Residential Buildings	582,197
One Single-Family Home Per Site	367,873
Multiple Single-Family Homes Per Site	183,936
Multi-Family Residential Buildings	30,388
Two-Family Houses	9,084
Apartments	21,304
Total Construction Sites	707,776

Source: U.S. Dept. of Labor, OSHA, Directorate of Standards and Guidance, Office of Regulatory Analysis–Safety, based on Dodge Data and Analytics, 2016.

In the United States, when a 911 call is made from a traditional telephone or wireline, the call is routed to a Public Safety Answering Point (PSAP) that is responsible for assisting people in a particular geographic area or community. Depending on the type of 911 service available, the telephone number of the caller and the location or address of the emergency is either communicated by the caller to the emergency dispatcher (Basic 911); or automatically displayed to the dispatcher through the use of equipment and database information (Enhanced 911). According to a 2001 report produced by the RCN Commission and the National Emergency Number Association (NENA) entitled, *Report Card to the Nation: The Effectiveness, Accessibility and Future of America's 911 Service,*[20] wireline 911 coverage is available to 97.8 percent of the U.S. population; however only 93 percent of all U.S. counties have either Basic or Enhanced wireline 911 coverage while 7 percent of U.S. counties are without any 911 services. NENA reported that these areas without any wireline 911 coverage are primarily rural in character with sparse population and generally high poverty levels; as well as inclusive of Native American lands and military installations (NENA, 2001).

In the December 5, 2014, version of the Federal Communications Commission's (FCC) 911 Wireless Service Guide, it was estimated that about 70 percent of 911 calls were placed from wireless phones (FCC, 2014). The FCC finds using wireless phones creates unique challenges for emergency response personnel because wireless or mobile phones are not associated with one fixed location or address. Although the location of the cell site closest to the 911 caller may provide a general indication of the caller's location, the FCC finds that the information is not always specific enough for rescue personnel to deliver assistance to the caller quickly (FCC, 2014). As a result, the FCC is now requiring wireless service carriers to implement its wireless Enhanced 911 program which will provide 911 dispatchers with additional information on wireless 911 calls. The FCC is allowing the implementation of its wireless Enhanced 911 program in two parts—Phase I and Phase II. Phase I requires carriers to provide the PSAP with the telephone number of the 911 wireless caller as well as the location of the cell site or base station transmitting the call. Phase II however, requires carriers to provide more precise information to the PSAP, such as the latitude and longitude of the caller whereby the accuracy of the geographical coordinates must be within 50 to 300 meters of the caller's location (FCC, 2014).

With the implementation of the wireless Enhanced 911 program, the total number of U.S. counties with 911 coverage has increased from 93 percent to nearly 97 percent. As of August 2017, NENA reported a total number of 3,135 U.S. counties, which include parishes, independent cities, boroughs, and Census areas. Of these counties, 97.7 percent (3,063) are now capable of receiving some[21] Phase I location information and 97.0 percent (3,041) are capable of receiving some Phase II. All wireless carriers, however, are expected to comply with Phase II of the FCCs requirements by 2019.[22]

Since all 911 emergency calls made are routed to a PSAP or call center based on the geographic location in which the call was made, for the purpose of this analysis, OSHA is interested in those U.S. counties where Enhanced 911 is neither available by wireline nor wireless device. Using the data provided by NENA, OSHA estimates that of the 3,135 recorded U.S. counties, 3 percent (87) have neither wireline nor wireless Enhanced 911 capabilities. By extension, for this analysis, OSHA further assumes that 3 percent of all construction project sites (21,233 of 707,776 construction project sites) are located within those counties without wireline and wireless Enhanced 911

[18] For the purpose of this section, in conformance with previous ICRs on this provision, OSHA deems the Dodge data to be the best source of information for new construction projects. This stands in contrast to U.S. Census construction data used later in the FEA in the context of Load Limit Posting provision because OSHA is interested in *all* construction projects started, but not necessarily completed, in a given year. While the Census construction data provides more detailed information on residential housing starts and completions, and total value of construction put in place, it does not provide information on the total number of construction projects started in a given year. No commenters questioned the use of either data series.

[19] Dodge defines single-family homes as single-family detached, stand-alone units. Single-family attached structures, including such buildings as condominiums and townhomes, are included in Dodge's multi-family category.

[20] Report Card to the Nation (RCN)—An RCN Commission was formed by the National Emergency Number Association (NENA) to review and grade the performance of 911. NENA serves its members and the greater public safety community as the only professional organization solely focused on 911 policy, technology, operations, and education issues.

[21] The term ''some,'' as defined by the National Emergency Number Association, means that some or all wireless carriers have implemented either Phase I or Phase II service in the County or the PSAPs. In order for any carrier to provide service, the County or PSAP must be capable of receiving the service. In most cases, all carriers are implemented in a County or PSAP, but one or more may be in the process of completing the implementation. See *www.nena.org/?page=911Statistics* (NENA, 2017).

[22] See 47 CFR 20.18—911 Service.

capabilities and will therefore be covered by this provision whereby employers must either post the latitude and longitude of the work site or other location-identification information that effectively communicates the location of the work site to the 911 emergency medical service dispatcher. The agency believes this is likely an overestimate of the number of construction sites affected by this provision of the proposal, as construction activity will generally parallel population concentration. Enhanced cell service, in turn, is more concentrated around population centers. NENA estimates that 98.7 percent of the population now has Phase II wireless service; 99.0 percent of PSAPs have Phase II service. The agency, however, did not receive any comments on this aspect of analysis, nor for the distribution of wireline and wireless service at construction sites.

OSHA estimates that it takes the average construction employee affected by this requirement 3 minutes (.05 hour) to obtain the latitude and longitude of worksite locations, write the information on material, and then to prominently post the information, as required by proposed § 1926.50(f). The agency posited in the PEA that this would not pose an issue of technological feasibility as the information could be easily downloaded from the internet before the crew leaves for the site; in the large majority of cases this information should be also be available onsite via common applications for smartphones. This was not questioned in comments, and OSHA therefore retained this as its final assessment. The Bureau of Labor Statistics' (BLS) 2017 Occupational Employment Statistics (OES) data indicate that the most common construction occupation is ''construction laborer.'' Partly for that reason, the agency believes this occupation is most representative of the workers actually posting the latitude and longitude load requirements at construction project sites. Consistent with that, OSHA, based on the OES data, estimates a wage of $18.70 per hour for the average affected construction worker (BLS, 2017). OSHA also estimated, based on BLS 2018 Employer Costs for Employee Compensation data, that construction employers paid an additional 46 percent in employee benefits,[23] implying a total employee compensation of $27.38 per hour in 2017. In addition, this is estimated to save an additional $3.18 per hour in overhead costs.[24] Therefore, the estimated annual burden hours and labor costs of this requirement are:

Burden hours: 21,233 construction project sites × .05 hour = 1,062 hours

Cost: 1,062 hours × ($27.38 employee compensation + $3.18 overhead) = $32,440

Based on these limited costs, OSHA preliminarily determined that the provision would be economically feasible; OSHA received no comments to the contrary and retains this conclusion for the FEA. As noted previously, the task of communicating relevant site information to rescue services is gradually being made easier by the spread of advanced telecommunications technology, such that in the near future the existing burden should be eliminated. OSHA neither received any comments on its preliminary estimate, nor on how long the costs will likely remain in effect. Therefore it retains this estimate, updated to 2017 dollars.

Permissible Exposure Limits Table

As discussed in the Summary and Explanation, 29 CFR 1926.55—Gases, Vapors, Fumes, Dusts, and Mists—is the Construction counterpart to 29 CFR 1910.1000—Air Contaminants, which enumerates hundreds of Permissible Exposure Limits (PELs) in its Z tables. Because 29 CFR 1926.55 is not as clear as its General Industry counterpart, OSHA is updating § 1926.55(a) and appendix A (now Tables 1 and 2) to help clarify the construction PELs. These updates will: (1) Change the term ''Threshold Limit Values'' to ''Permissible Exposure Limits;'' (2) eliminate language that sounds advisory; (3) eliminate confusing language; (4) divide appendix A into Tables 1 and 2; (5) correct several noted errors in appendix A; and (6) correct cross-references to the asbestos standard. OSHA deems these changes to be simple clarifications which will not change the substantive effect of this rule. OSHA did not receive any comments about any potential costs because of these changes and therefore concludes that these revisions will not result in changes to the cost or impact of 29 CFR 1926.55.

Process Safety Management of Highly Hazardous Chemicals

OSHA is replacing the regulatory text of its Process Safety Management (PSM) of Highly Hazardous Chemicals construction regulation, § 1926.64, with a cross-reference to the corresponding general industry regulation in 29 CFR 1910.119. The requirements applicable to construction work in 29 CFR 1926.64 are identical to those set forth in 29 CFR 1910.119. This change will only serve to eliminate duplicative regulatory text and as such will present no additional compliance burden to employers. In the absence of public comment to the contrary, OSHA has determined that this cross-reference to an existing standard has no cost.

Lanyard/Lifeline Break Strength

OSHA is lowering the minimum breaking strength requirement in § 1926.104—Safety Belts, Lifelines and Lanyards, paragraph (c), from 5,400 pounds to 5,000 pounds, which is in better accord with market practice. 5,400-pound breaking strength is not generally offered on the market. This may have cost savings to the extent that some employers purchased lanyards/lifelines with much higher strength. As discussed in the Summary and Explanation of that section, the agency believes a 5,000-pound requirement will still provide a more than sufficient safety factor. Because this change lowers the minimum requirement, employers will not be required to purchase new equipment. When employers do replace their equipment, they could continue to purchase lifelines with a breaking strength of 5,400 pounds, or with a breaking strength of 5,000 pounds. This revision also will bring § 1926.104(c) into conformance with the lanyard and lifeline breaking-strength requirement in the Fall Protection standard, at § 1926.502(d)(9). As a result, OSHA preliminarily concluded that this change will not add any new compliance costs for employers and, receiving no comments to the contrary, believes this is descriptive of the final rule as well. To the extent this eliminates confusion by employers, this may provide some cost savings.

Manual on Uniform Traffic Control Devices

Under 29 CFR part 1926, subpart G—Signs, Signals, and Barricades, OSHA requires that employers comply with the mandatory provisions of Part 6 of the Manual on Uniform Traffic Control Devices (MUTCD). Currently, employers comply with Part 6 when they use one of two versions of MUCTD: The 1988

[23] BLS, 2017. Employer costs for employee benefits (other than wage and salary) were estimated to be 31.70 percent of total compensation for workers employed in construction. The fringe benefit factor is calculated by 1/(1 − percent of total compensation attributable to employee benefits, or 1/(1 − .317) = 1.4641. Total employer cost for employee compensation is calculated by multiplying the base wages ($18.70) by the fringe benefits factor (1.4641).

[24] As indicated previously, overhead is estimated to equal 17% of base wages, or $3.18 per hour.

Edition, Revision 3, September 3, 1993 MUTCD (''1988 Edition'') or the Millennium Edition, December 2000 MUTCD (''Millennium Edition''). Since OSHA's last published update to subpart G, requiring employers to follow one of the two MUTCD editions above, the Department of Transportation (DOT) has updated 23 CFR 655.601 through 655.603 to require adherence to the 2009 Edition, November 4, 2009, MUTCD (''2009 Edition''). The agency is updating subpart G to require employers to follow the MUTCD 2009 Edition.

23 CFR 655.603 states that the MUTCD is the national standard for all traffic control devices installed on any street, highway, or bicycle trail open to public travel. It also requires all States, within two years after a new national MUTCD edition is issued or any national MUTCD amendments are made, to adopt the new MUTCD in the State, adopt the national MUTCD with a State Supplement that is in substantial conformance with the new MUTCD, or adopt a State MUTCD that is in substantial conformance with the new MUTCD.

Each State enacts its own laws regarding compliance with standards for traffic control devices in that State. If the State law has adopted a State Supplement or a State MUTCD that the Federal Highway Administration (FHWA) has found to be in substantial conformance with the national MUTCD, then those State requirements are what the local road agencies (as well as the State DOT) must abide by. The exception is traffic control devices installed on a federally aided project, in which case 23 CFR 655.603(d)(2) specifically requires those devices to comply with the national MUTCD before the road can be opened or reopened to the public for unrestricted use.

The agency believes any employer costs related to incorporating the updated MUCTD reference into subpart G are very limited because, first, the updated DOT rules are already currently in force for all public roads. Second, even in the limited circumstances of construction on private roads, the MUCTD rules are already likely followed. Finally, the changes from the prior editions are minor and could easily be outweighed by eliminating the burden created by having conflicting DOT and OSHA requirements.

Private roads open to public travel are now subject to the same traffic control standards as public streets and highways. However, the FHWA does not require State and/or local highway agencies to have specific authority or enforcement responsibility for traffic control devices on private roads to ensure compliance with the MUTCD. Owners or parties responsible for such private roads are encouraged to bring the traffic control devices into compliance with the MUTCD and other applicable State Manuals, and those who do not may find themselves exposed to increased tort liability. State and local jurisdictions can encourage MUTCD compliance on private roads by incorporating pertinent language into zoning requirements, building and occupancy permits, and similar controls that they exercise over private properties.

As a practical matter, available data on private road construction indicate that it represents a very small portion of total road construction activity. Data from the Census Construction Spending Survey indicate that it represents less than 1 percent of all funds dedicated to highway and street construction (Census, 2014).[25] This leaves a very limited scope of construction signage not already governed by the updated DOT rules.

Since all contractors engaged in construction of public roads are now required to follow the current MUTCD, only those firms that work exclusively on private roads would incur costs associated with this proposal. Contractors that work on both public and private roads should not see an increased burden because they would already need to be in compliance with the MUTCD to work on public roads. Considering that there is pressure, both from a regulatory and liability perspective, for firms that work exclusively on private roads to follow the MUTCD, OSHA believes the total number of these firms potentially incurring costs as a result of this proposal would be very small. OSHA received no comments on the number of contractors that work exclusively on private roads and are therefore not required to follow the MUTCD.

For any firms not already complying with the updated MUTCD, the cost of compliance would be very limited. As explained in the Summary and Explanation, the revisions to the MUTCD make the document more user friendly and account for advances in technology. A comparison of the 1998 and 2009 updates shows fewer and less burdensome new requirements, but more guidance and support material which makes the document easier to use. This change to the OSHA rule should decrease the burden on employers by eliminating confusion as to which edition they must comply with. It would also inform employers that compliance with DOT regulations will not run afoul of outdated OSHA regulations. Most of the new provisions provide more options to employers, which should either increase safety or reduce the burden to employers.

Nonetheless, the agency has identified one[26] proposed change in the 2009 Edition that could have a very small cost for those employers doing construction work exclusively on private roads that are not already following the updated MUTCD for these items. The change prohibits contractors from relying on hand-signs alone to control traffic. This burden would only apply to a subset of contractors that use flaggers to control traffic (as opposed to something like automated flagger-assistance devices) and choose to only use hand signals to accomplish this task. Each of these contractors would need to purchase at least one stop sign or flag. OSHA has determined that a flag would cost, on average, $8.23 each, dependent on size (ERG, 2015).[27]

The number of signs or flags a contractor needs for these situations would presumably be dependent on the number of simultaneous projects that the road construction firm engages in during a typical season, or how large and complex such projects are. While smaller contractors may be more likely to engage solely in private road operations, larger, more complex projects demanding more equipment would almost certainly fall to larger contractors also employed in public road construction. Considering the very limited number of contractors and situations that would likely be impacted by this proposal, the agency believes that most of the potentially affected firms would not need more than a handful of either signs or flags.

As indicated in the PEA, it is not clear whether any firm would incur new costs as a result of this update to the 2009 Edition, but as shown, any such costs would be very limited in nature and

[25] Since private spending on Highway and Street construction is relatively small in comparison to other categories of spending, it does not appear as a separate item, but can be derived from subtracting Total Public Construction spending on Highway and Street construction from Total Construction spending on Highway and Street construction. 2013 data indicates private spending was well below 1 percent of total spending in this category. This pattern was consistent at least as far back as 2002.

[26] In the proposed rule OSHA mistakenly identified a second change in the 2009 Edition as a new requirement. The Agency stated that ''[o]ne change is a requirement to use a new symbol and additional sign for a shoulder drop-off'' (81 FR 68504, 68534). Neither the use of a shoulder drop-off sign nor an additional sign is required by the 2009 Edition under Section 6F.44.

[27] Inflated to 2017 dollars using GDP deflator (OSHA 2018).

would be an insignificant portion of a contractor's annual profit. OSHA therefore did not believe this change would have a significant impact to any firm or raise an issue of economic feasibility. The agency did not receive any comments to contradict this preliminary conclusion, and therefore believes it accurately describes the final rule.

Load Limit Posting

OSHA is removing the load limit posting requirement for single-family dwellings and wood-framed multi-family structures in 29 CFR 1926.250—General Requirements for Storage, paragraph (a)(2). OSHA estimates that removing the requirement for employers to post maximum safe load limits of floors in storage areas when constructing single-family dwellings or wood-framed multi-family structures will result in a cost savings to employers engaged in these construction activities of approximately $5,806,000.

OSHA estimates that it takes the average construction employee affected by this requirement 15 minutes (0.25 hours) to develop and post the currently required signs, assuming the information is readily available from current engineering estimates. The Bureau of Labor Statistics' (BLS) 2017 Occupational Employment Statistics (OES) data (BLS, 2017) indicate that the most common construction occupation is ''construction laborer.'' Partly for that reason, the agency believes this occupation is most representative of the workers actually posting the load limit requirement at such dwellings. Consistent with that, OSHA, based on the OES data, estimates a wage of $18.70 per hour for the average affected construction worker (BLS, 2017). OSHA also estimates that, based on BLS 2018 Employer Costs for Employee Compensation data, employers pay an additional 46 percent in employee benefits,[28] implying a total employee compensation of $27.38 per hour in 2017. This is estimated to save an additional $3.18 in hourly overhead costs.[29] The resulting labor and overhead savings is $30.56 per hour. According to the U.S. Census, in 2016 there were 738,000 single-family houses and 11,000 wood-framed multi-family residential structures constructed (Census, 2016; pp. 213, 477).[30] As was presented in the PEA, OSHA in this FEA estimates that, on average, each single-family house would have one relevant storage area per structure, producing one required posting. For the final rule, the definition of structures covered by the exemption has been expanded somewhat to include wood frame multi-family residential structures. Because such structures are more likely to have multiple storage areas, the agency estimates that on average they would need to have two required postings currently.[31] Using this data, OSHA estimates that the yearly burden on employers affected by this proposed revision will be reduced by $7.64 per posting ($30.56/hour × 0.25 hours) for a total cost savings of $5,806,000 ($7.64 cost per posting × 738,000 single-family homes plus $7.64 × two postings × 11,000 multi-family structures) to the industry.

No public comments challenged OSHA's preliminary cost methodology. Therefore, based on the profile data described above, the final estimated burden hours and labor costs reduced by this requirement are:

Reduced burden hours: 760,000 total postings × .25 hours = 190,000 hours
Reduced cost: 190,000 hours × ($27.38 employee compensation + $3.18 overhead) = $5,806,000

Rollover Protective Structures (ROPS)

OSHA is amending the existing standards in 29 CFR part 1926, subpart W—Rollover Protective Structures; Overhead Protection (§§ 1926.1001, 1926.1002, and 1926.1003). The existing standards, which are based on consensus standards from 1970, are amended to remove the provisions that specify test procedures and performance requirements. The revised provisions will reference the 1970 consensus standards for equipment manufactured prior to the effective date of this final rule. They also reference the most recent ISO standards: ISO 3471:2008, ISO 5700:2013 and ISO 27850:2013, for new equipment manufactured after the effective date of this final rule. It is OSHA's understanding that all industries affected by this change are already following the new ISO standards, and therefore has concluded that this change will not create any new costs for employers. OSHA received no comments that would rebut the agency's conclusion on current adherence to the ISO standards (and therefore the conclusion of no new costs) among the affected industries.

The agency is also expanding the existing regulatory language of §§ 1926.1000 and 1926.1001 to cover compactors and skid-steer loaders, as indicated previously by reserving existing § 1926.1000(a)(2). OSHA believes that this new equipment, as with the equipment currently covered by the existing standard, already adheres to the minimum performance criteria for ROPS as set forth in the recent ISO standards, and received no comment on it. OSHA concludes that this change will not add any new compliance cost to employers. OSHA received no comments on this issue.

Underground Construction—Diesel Engines

Existing regulatory language in § 1926.800(k)(10)(ii) requires that mobile diesel-powered equipment used underground comply with the Mine Safety Health Administration's (MSHA) provisions of 30 CFR part 32. In 1996, MSHA revoked part 32 and replaced it with updated provisions in 30 CFR part 7, subpart E, and 30 CFR 75.1909 Non-permissible diesel-powered equipment; design and performance requirements; 75.1910 Non-permissible diesel-powered equipment; electrical system design and performance requirements; and 75.1911 Fire suppression systems for diesel-powered equipment and fuel transportation units (61 FR 55411). In 2001, MSHA issued 30 CFR 57.5067 to allow engines that meet Environmental Protection Agency (EPA) requirements to be used as an alternative to seeking MSHA approval under part 7, subpart E (66 FR 5706). The agency proposes to update the regulatory language in § 1926.800(k)(10)(ii) to cross-reference these updated provisions.

These changes will allow employers who use diesel-powered engines on

[28] BLS, 2018. Employer costs for employee benefits (other than wage and salary) were estimated to be 31.70 percent of total compensation for workers employed in construction. The fringe benefit factor is calculated by 1/(1 − percent of total compensation attributable to employee benefits), or 1/(1 − .317) = 1.4641. Total employer cost for employee compensation is calculated by multiplying the base wages ($18.70) by the fringe benefits factor (1.4641).

[29] As indicated previously, overhead is estimated to equal 17% of base wages, or $3.18 per hour.

[30] In the 911 Emergency Medical Services section of the FEA presented earlier, the Agency examined total construction starts, which were estimated using Dodge data. Included within that total were new home starts. However, as has historically been the case when examining the paperwork burden for 29 CFR 1926.250, the Agency is using U.S. Census data rather than the Dodge report. As referenced in the PEA, the Dodge report did not include a necessary distinction in the data on townhomes separate from condominiums; townhomes and condominiums were both grouped together in the Dodge report's multifamily category. Therefore, OSHA believes the data provided from the U.S. Census was the best available for analyzing the proposed update to 29 CFR 1926.250(a)(2). While this element in the data was not essential for the FEA, due to a change of scope in the load limit exemption, the Agency is retaining its consistency with the data series used in the PEA. No commenters questioned the use of either data series.

[31] Since many multi-family structures have three or more levels and may span a considerable horizontal distance, this may represent a conservative estimate of the potential cost savings from reduced posting requirements per structure.

mobile equipment in underground construction to (1) use current MSHA procedures to obtain approval plates to affix to the engines, or (2) meet or exceed the applicable EPA requirements listed at MSHA Table 57.5067–1. Based on available information, OSHA has determined that currently manufactured equipment meets the requirements and is generally compliant with the more stringent EPA Tier 3 and Tier 4 emission requirements (ERG, 2015). The agency therefore preliminarily concluded that all applicable new equipment currently available in the market meets the proposed requirements.

OSHA recognizes that there may be some employers using equipment that predates the newer MSHA standards, and the EPA requirements referenced in them. To avoid the costs of replacing existing equipment in use, the agency is allowing equipment purchased before the effective date of the final rule to continue to comply with the terms of existing § 1926.800(k)(10)(ii) (including having been approved by MSHA under 30 CFR part 32 (1995) or be determined to be equivalent to such MSHA-approved equipment). OSHA received no comment on the number of engines in use that meet the existing standard but will not meet the requirements of the new MSHA standard and whether continued use of such equipment presents a serious safety or health hazard. However, as discussed in the Summary and Explanation, commenters agreed the change was desirable. As further indicated in the discussion, the final rule has been refined to better reflect the technical needs of underground construction environments, at the suggestion of commenters. This change does not modify OSHA's preliminary conclusion that this provision, eliminating reference to obsolete MSHA standards, will not produce significant costs of compliance.

In summary, because diesel equipment manufactured for underground construction apparently conforms with the newer MSHA standards, and because this rule does ''grandfather'' existing equipment, the agency believes employers will not have additional expenses in complying with the proposed change to the underground construction standard. OSHA received no comments on this conclusion and therefore the agency carries forward its preliminary assessment to this FEA.

Coke Oven Emissions

Section 1926.1129 regulates exposure to coke oven emissions in construction. In the Summary and Explanation, the point was made that the provisions of this standard do not fit construction work. Therefore OSHA is deleting 29 CFR 1926.1129 (and the reference to it in 29 CFR 1926.55).

An interpretation letter to Mr. Mark D. Katz of the law firm Ulmer & Berne LLP from Assistant Secretary Charles Jeffress on June 22, 1999, stated that OSHA was removing 29 CFR 1926.1129 from OSHA's internet website and intended to delete it from Part 1926 Code of Federal Regulations. It also stated that OSHA would formally notify its field offices that § 1926.1129 would not to be enforced.[32] Since OSHA is not enforcing § 1926.1129 and it has no applicability to construction, this change has no cost.

Removal of Social Security Number Collection Requirements From OSHA's Standards

As discussed in the Summary and Explanation, OSHA is deleting the requirements in its standards for employers to use social security numbers to identify employees in exposure monitoring, medical surveillance, and other records. The agency believes that while this change will help employers to protect their employees from identity theft, it does not impose new costs upon employers. One anonymous commenter was concerned that removing social security numbers from all existing document would be expensive (OSHA–2012–0007–0647). However, the proposed and final changes do not require employers to delete social security numbers from existing records, nor do they prohibit employers from continuing to use them to identify employees; employers are simply no longer required to include employee social security numbers on the records. The agency believes that these changes have benefits to both employees and employers and cost savings, but OSHA has not quantified those benefits and savings for this analysis.

Summary of Costs

Table IV–2 provides a brief summary of the cost savings and benefits that OSHA estimates will result from this rule. The expected total cost savings per year are approximately $6,066,000. Given that these are all annual cost savings, the final estimate is the same when discounted at either 3 or 7 percent. For the same reason, when the Department uses a perpetual time horizon to allow for cost comparisons under E.O. 13771, the annualized cost savings of the final rule are also $6,066,000 with 7 percent discounting. As indicated earlier, this final estimate includes an overhead factor in the labor costs. This is estimated to add an additional savings of $603,500, or 11.3%, on what would have been an estimated savings of $5,462,000.

TABLE IV–2

Item	Cost savings/benefits
Cost Savings:	
Removes the load limit posting requirement for single family dwellings and wood-framed multi-family structures in § 1926.250(a)(2).	$5,806,000.
Removes the requirement for periodic CXR in §§ 1910.1029, 1910.1045, and 1910.1018	$292,500.
Revises paragraph (f) in 29 CFR 1926.50—Medical Services and First Aid	−$32,440.
Total	$6,066,000.
Other Benefits:	
Adds cross-reference between §§ 1904.5 and 1904.10(b)(6)	Clarifies existing employer obligations regarding recording of hearing loss.
Allows digital storage of chest roentgenograms in §§ 1910.1029, 1910.1045, 1910.1018, 1910.1001, 1915.1001, 1926.1101, 1910.1027, and 1926.1127.	Brings standard up to date, simplifies.
Updates required pulmonary function testing requirements in § 1910.1043	Brings OSHA standards up to current technology and medical practices.

[32] U.S. Dept. of Labor, OSHA, Standard Interpretation, Coke Oven Emissions, *www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=22754* (accessed November 24, 2017).

TABLE IV–2—Continued

Item	Cost savings/benefits
Eliminates ''feral cats'' from definition of vermin in § 1926.250(b)(3)	Eliminates the threat of unnecessary extermination.
Clarifies language in Construction PELS, 29 CFR 1926.55	Clarifies existing construction employer obligations regarding PELs.
PSM cross-reference between §§ 1926.64 and 1910.119	Eliminates unneeded regulatory text.
Lowering lanyard/lifeline break strength, § 1926.104(c)	Harmonizes with fall protection rule § 1926.502.
Updates 29 CFR part 1926, subpart G, to latest DOT MUTCD standards	Harmonizes nationwide rules, greater safety, incidental costs.
Updates Rollover Protective Structure rule (ROPS), 29 CFR part 1926, subpart W	Harmonizes OSHA rule with more recent consensus standards.
Update references in Underground Construction—Diesel Engines, § 1926.800(k)(10)(ii)	Simplifies/clarifies employer obligations.
Eliminates Coke Oven Emissions in Construction, § 1926.1129	Eliminates unneeded regulatory text.
Removal of Social Security Number requirements	Provides greater privacy protection for employees.

Source: U.S. Dept. of Labor, OSHA, Directorate of Standards and Guidance, Office of Regulatory Analysis—Safety, 2018.

Technological Feasibility

The purpose of the provisions in this standard is to reduce the burden on employers, or provide employers with compliance flexibility by removing or revising confusing, outdated, duplicative, or inconsistent requirements, while maintaining or enhancing the level of protection for employees. This standard deletes and revises a number of provisions in existing OSHA standards. In most instances, the agency chose to revise outdated provisions to improve clarity, as well as consistency, with standards more recently promulgated by the agency or current consensus standards. In other instances, the provisions revise standards to improve consistency with current technology or research, and to clarify OSHA's original intent. In all cases where a standard has been updated to provide new equipment requirements, there are products currently on the market that will satisfy the standard. The only requirement with significant costs requires posting the latitude and longitude in a prominent place. This is easily technologically feasible. Because of the reduction or removal of current requirements and because many of the updates reflect what is already practiced in the applicable industry, OSHA preliminarily concluded that the proposed rule would be technologically feasible. The agency received no comments to suggest otherwise, and retains that conclusion for the FEA.

Economic Feasibility

OSHA concludes that the final provisions of this standards improvement action do not impose costs of any significance on employers, providing primarily cost savings, and therefore the agency concludes that this rule is economically feasible. The PEA had also preliminarily reached this conclusion with regard to the proposal. The only provision with significant costs requires approximately three minutes of time per establishment. Such a cost is obviously feasible. It is possible that a minimal number of construction projects will incur costs as a result the changes to MUTCD. However the costs per project will be minimal.

Regulatory Flexibility Screening Analysis and Certification

In accordance with the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.* (as amended), OSHA examined the regulatory requirements of this rule to determine whether these requirements would have a significant economic impact on a substantial number of small entities. This rule has estimated annual costs of $32,440 and will lead to approximately $6.1 million per year in cost savings to regulated entities. Since the costs related to this rule (from posting location information in limited circumstances) and cost savings (primarily from no longer having to post load limit information in many situations) amount to a few dollars per construction project, and are widely dispersed geographically and throughout the industry, the agency believes this rule does not possess the potential to have a significant impact on a substantial number of small entities. The agency therefore certifies that this rule will not have a significant economic impact on a substantial number of small entities.

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V. Legal Considerations

The purpose of the Occupational Safety and Health Act of 1970 (OSH Act; 29 U.S.C. 651 et al.) is ''to assure so far as possible every working man and woman in the Nation safe and healthful working conditions and to preserve our human resources.'' (29 U.S.C. 651(b)). To achieve this goal, Congress authorized the Secretary of Labor to promulgate and enforce occupational safety and health standards; authorized summary adoption of existing national consensus and established Federal standards within two years of the effective date of the OSH Act (29 U.S.C. 655(a)); authorized promulgation of standards pursuant to notice and comment (29 U.S.C. 655(b)); and required employers to comply with OSHA standards (29 U.S.C. 654(b)).

An occupational safety or health standard is a standard ''which requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment and places of employment.'' (29 U.S.C. 652(8)). A standard is reasonably necessary or appropriate within the meaning of section 652(8) if it substantially reduces or eliminates significant risk. In addition, it must be technologically and economically feasible, cost effective, and consistent with prior agency action, or a justified departure. A standard must be supported by substantial evidence, and be better able to effectuate the OSH Act's purposes than any national consensus standard it supersedes. (See 58 FR 16612–16616, March 30, 1993.)

A standard is technologically feasible if the protective measures it requires already exist, can be brought into existence with available technology, or can be created with technology that can reasonably be expected to be developed. (See *American Textile Mfrs. Institute* v. *OSHA,* 452 U.S. 490, 513 (1981) (*ATMI*); *American Iron and Steel Institute* v. *OSHA,* 939 F.2d 975, 980 (D.C. Cir. 1991) (*AISI*).)

A standard is economically feasible if industry can absorb or pass on the costs of compliance without threatening its long-term profitability or competitive structure. See *ATMI,* 452 U.S. at 530 n. 55; *AISI,* 939 F.2d at 980. A standard is cost effective if the protective measures it requires are the least costly of the available alternatives that achieve the same level of protection. *ATMI,* 452 U.S. at 514 n. 32; *International Union, UAW* v. *OSHA,* 37 F.3d 665, 668 (D.C. Cir. 1994) (*LOTO II*). Section 6(b)(7) of the OSH Act authorizes OSHA to include among a standard's requirements labeling, monitoring, medical testing, and other information-gathering and transmittal provisions. (29 U.S.C. 655(b)(7)). OSHA safety standards also must be highly protective. (See 58 FR at 16614–16615; *LOTO II,* 37 F.3d at 668–669.) Finally, whenever practical, standards shall ''be expressed in terms of objective criteria and of the performance desired.'' (29 U.S.C. 655(b)(5)).

VI. OMB Review Under the Paperwork Reduction Act of 1995

A. Overview

The purposes of the Paperwork Reduction Act 1995 (PRA), 44 U.S.C. 3501 *et seq.,* include enhancing the quality and utility of information the Federal government requires and minimizing the paperwork and reporting burden on affected entities. The PRA requires certain actions before an agency can adopt or revise a collection of information (paperwork), including publishing a summary of the collection of information and a brief description of the need for and proposed use of the information. PRA defines ''collection of information'' as ''the obtaining, causing to be obtained, soliciting, or requiring the disclosure to third parties or the public, of facts or opinions by or for an agency, regardless of form or format'' (44 U.S.C. 3502(3)(A)). Under PRA, a Federal agency may not conduct or sponsor a collection of information unless it is approved by OMB under the PRA, and it displays a currently valid OMB control number. The public is not required to respond to a collection of information unless it displays a currently valid OMB control number (44 U.S.C. 3507). Also, notwithstanding any other provisions of law, no person shall be subject to penalty for failing to comply with a collection of information if the collection of information does not display a currently valid OMB control number (44 U.S.C. 3512).

SIP–IV modifies twenty-five Information Collections currently approved by the Office of Management and Budget (OMB) under the PRA.

B. Solicitation of Comments

The Department is submitting a series of Information Collection Requests (ICRs) to revise the collections in accordance to this Final Rule, as required by the PRA. See 44 U.S.C. 3507(d). Some of these revisions will result in changes to the existing burden hour and/or cost estimates. Other revisions will be less significant and will not change the ICR burden hour and cost estimates.[33]

The agency solicited comments on the information collection requirements contained in the NPRM and did not receive any comments in response to the information collection requirements.

C. Revisions to the Collection of Information Requirements

As required by 5 CFR 1320.5(a)(1)(iv) and 1320.8(d)(2), the following paragraphs provide information about the ICRs, including the changes in burden associated with the revisions to information collection requirements.

1. *Title:* Standards Improvement Project—Phase IV (SIP–IV).

2. *Description of revisions to the ICRs:* The SIP–IV Final Rule adds, removes, or revises collection of information requirements, as further explained in Table 1(a) that identifies those ICRs where the Final Rule changed burden hours and costs. For those ICRs, Table 1(b) itemizes the responses, frequencies,

[33] The Final Rule contains some revisions to existing standard provisions that are not collections of information. These revisions are not addressed in this preamble section. However other revisions will modify language contained in a currently OMB approved information collection (paperwork analysis), though they will not change burden hour or cost estimates. These information collections, referenced by OMB Control number, are included in this section since the Agency will prepare and submit an ICR to OMB to incorporate the revised language into the existing information collection.

time, burden hours, and cost as a result of the program change. Table 2 identifies those ICRs where the Final Rule will add to or revise the text of standards, but do not result in a burden or cost change as result.

TABLE 1(a)—ICRS WITH BURDEN HOUR CHANGES AS A RESULT OF THE RULE

ICR title	OMB control No.	Provisions being modified
Coke Oven Emissions (29 CFR 1910.1029).	1218–0128	OSHA is removing the requirement for periodic chest x-rays as part of the medical exams for employees. In addition, OSHA is adding the option of digital radiography to its existing standards because digital radiography systems are rapidly replacing traditional analog film-based systems in medical facilities.
Acrylonitrile (29 CFR 1910.1045).	1218–0126	OSHA is removing the requirement for periodic chest x-rays as part of the medical exams for employees. OSHA is adding the option of digital radiography to its existing standards because digital radiography systems are rapidly replacing traditional analog film-based systems in medical facilities.
Inorganic Arsenic (29 CFR 1910.1018).	1218–0104	OSHA is removing the requirement for periodic chest x-rays as part of the medical exams for employees. OSHA is adding the option of digital radiography to its existing standards because digital radiography systems are rapidly replacing traditional analog film-based systems in medical facilities.
Construction Standards on Posting Emergency Telephone Numbers and Floor Load Limits (29 CFR 1926.50 and 29 CFR 1926.250).	1218–0093	OSHA is adding to 29 CFR 1926.50(f) a requirement that when an employer uses a communication system for contacting 911 services, if the communication system is in an area that does not automatically supply the caller's latitude and longitude to the 911 dispatcher, the employer must post or otherwise provide to employees the latitude and longitude of the work site or other information that communicates the location of the worksite. In addition, OSHA is removing the load limit posting requirement for single family dwellings and wood-framed multi-family structures in 29 CFR 1926.250.

TABLE 1(b)—ESTIMATED BURDEN HOURS AND COSTS

ICR title and paragraph modified	OMB control No.	Number of respondents	Number of responses	Frequency per response	Average time per response (hours)	Estimated burden hour/ program change	Estimated cost (capital-operation and maintenance) change [34]
Coke Oven Emissions (29 CFR 1910.1029) (§ 1910.1029(j)).	1218–0128	2,498	2,498	Annual	1.42	−624	−$179,357
Acrylonitrile (29 CFR 1910.1045) (§ 1910.1045(n)).	1218–0126	542	542	Annual	1.25	−135	−38,916
Inorganic Arsenic (29 CFR 1910.1018) (§ 1910.1018(n)).	1218–0104	589	589	Annual	1.42	−148	−42,290
Construction Standard on Posting Emergency Telephone Numbers (29 CFR 1926.50) [35] (§ 1926.50(f)).	1218–0093	21,233	21,233	Annual	.05	+1,062	[36] +27,761
Construction Standard on Floor Load Limits (29 CFR 1926.250) (§ 1926.250(a)).	1218–0093	760,000	760,000	Annual	0.25	−190,000	[37] −4,966,600
Grand Total		784,862	784,862			−189,845	−5,199,402

TABLE 2—ICRS WITH NO BURDEN HOUR CHANGES

ICR title	OMB control No.	Provisions being modified
Asbestos in General Industry (29 CFR 1910.1001).	1218–0133	OSHA is adding the option of digital radiography to its existing standards because digital radiography systems are rapidly replacing traditional analog film-based systems in medical facilities.
Asbestos in Construction (29 CFR 1926.1101).	1218–0134	OSHA is adding the option of digital radiography to its existing standards because digital radiography systems are rapidly replacing traditional analog film-based systems in medical facilities.
Asbestos in Shipyards (29 CFR 1915.1001).	1218–0195	OSHA is adding the option of digital radiography to its existing standards because digital radiography systems are rapidly replacing traditional analog film-based systems in medical facilities.
Cadmium in Construction (29 CFR 1926.1127).	1218–0186	OSHA is adding the option of digital radiography to its existing standards because digital radiography systems are rapidly replacing traditional analog film-based systems in medical facilities.

[34] Totals in this column may vary slightly from those in the Final Economic Analysis (FEA) due to rounding in the FEA.

[35] Both 29 CFR 1926.50 and 1926.250 are covered by the same ICR, 1218–0093.

[36] This cost is under item 12 for posting emergency telephone numbers of the ICR, 1218–0093.

[37] This cost is under item 12 for posting floor load limits of the ICR, 1218–0093.

TABLE 2—ICRs WITH NO BURDEN HOUR CHANGES—Continued

ICR title	OMB control No.	Provisions being modified
Cadmium in General Industry (29 CFR 1910.1027).	1218–0185	OSHA is adding the option of digital radiography to its existing standards because digital radiography systems are rapidly replacing traditional analog film-based systems in medical facilities.
Cotton Dust (29 CFR 1910.1043).	1218–0061	OSHA is revising paragraph (h) and appendix D of its Cotton Dust standard. Many of the revisions are simply editorial, to clarify existing language, as well as to update outdated pulmonary function measurements. OSHA is also updating paragraph (h)(2)(iii) to require a determination of the FEV_1/FVC ratio, and the evaluation of FEV_1, FVC, and FEV_1/FVC against the lower limit of normal (LLN) for each race/ethnic group, by age, which is consistent with generally accepted practices.

This final rule will also have an impact on the provisions in OSHA's standards that currently require employers to include employee Social Security Numbers (SSNs) on exposure monitoring, medical surveillance, and other records. As explained above in the Summary and Explanation of the Rule section (see Section III.B.17.), the agency previously considered stakeholder comments regarding the SSN collection requirements in OSHA's standards during the SIP II (70 FR 1112, January 5, 2005) and Respirable Crystalline Silica (81 FR 16285, March 25, 2016) rulemakings. Eliminating SSN collection requirements from OSHA's standards will affect several of the ICRs covered under the PRA. Table 3 shows the control number, title, and section modified for each of the ICRs that will be affected. The agency believes removing the SSNs will have no measureable impact on employer burden.

TABLE 3—ICRs AFFECTED BY SOCIAL SECURITY NUMBER REMOVAL

OMB control No.	Title	Section modified
1218–0202	Hazardous Waste Operations and Emergency Response for General Industry (29 CFR 1910.120) and Construction (29 CFR 1926.65).	1910.120(f)(8)(ii)(A), 1926.65(f)(8)(ii)(A).
1218–0133	Asbestos in General Industry (29 CFR 1910.1001)	1910.1001(m)(1)(ii)(F), 1910.1001(m)(3)(ii)(A), 1910.1001, appendix D.
1218–0010	Vinyl Chloride Standard (29 CFR 1910.1017)	1910.1017(m)(1).
1218–0104	Inorganic Arsenic (29 CFR 1910.1018)	1910.1018(q)(1)(ii)(D), 1910.1018(q)(2)(ii)(A).
1218–0092	Lead Standard in General Industry (29 CFR 1910.1025)	1910.1025(d)(5), 1910.1025(n)(1)(ii)(D), 1910.1025(n)(2)(ii)(A), 1910.1025(n)(3)(ii)(A), 1910.1025, appendix B.
1218–0252	Hexavalent Chromium Standards for General Industry (29 CFR 1910.1026), Shipyard Employment (29 CFR 1915.1026), and Construction (29 CFR 1926.1126).	1910.1026(m)(1)(ii)(F), 1910.1026(m)(4)(ii)(A), 1915.1026(k)(1)(ii)(F), 1915.1026(k)(4)(ii)(A), 1926.1126(k)(1)(ii)(F), 1926.1126(k)(4)(ii)(A).
1218–0185	Cadmium in General Industry Standard (29 CFR 1910.1027).	1910.1027(n)(1)(ii)(B), 1910.1027(n)(3)(ii)(A), 1910.1027, appendix D.
1218–0129	Benzene (29 CFR 1910.1028)	1910.1028(k)(1)(ii)(D), 1910.1028(k)(2)(ii)(A).
1218–0128	Coke Oven Emissions (29 CFR 1910.1029)	1910.1029(m)(1)(i)(*a*), 1910.1029(m)(2)(i)(*a*).
1218–0180	Bloodborne Pathogens Standard (29 CFR 1910.1030)	1910.1030(h)(1)(ii)(A).
1218–0061	Cotton Dust (29 CFR 1910.1043)	1910.1043(k)(1)(ii)(C), 1910.1043(k)(2)(ii)(A), 1910.1043, appendices B–I, B–II, B–III.
1218–0101	1,2-Dibromo-3-Chloropropane (DBCP) Standard (29 CFR 1910.1044).	1910.1044(p)(1)(ii)(*d*), 1910.1044(p)(2)(ii)(*a*).
1218–0126	Acrylonitrile Standard (29 CFR 1910.1045)	1910.1045(q)(2)(ii)(D).
1218–0108	Ethylene Oxide (EtO) Standard (29 CFR 1910.1047)	1910.1047(k)(2)(ii)(F), 1910.1047(k)(3)(ii)(A).
1218–0145	Formaldehyde Standard (29 CFR 1910.1048)	1910.1048(o)(1)(vi), 1910.1048(o)(3)(i), 1910.1048(o)(4)(ii)(D), 1910.1048, appendix D.
1218–0184	4,4′-Methylenedianiline (MDA) for General Industry (29 CFR 1910.1050).	1910.1050(n)(3)(ii)(D), 1910.1050(n)(4)(ii)(A), 1910.1050(n)(5)(ii)(A).
1218–0170	1,3-Butadiene Standard (29 CFR 1910.1051)	1910.1051(m)(2)(ii)(F), 1910.1051(m)(4)(ii)(A), 1910.1051, appendix F.
1218–0179	Methylene Chloride (29 CFR 1910.1052)	1910.1052(m)(2)(ii)(F), 1910.1052(m)(2)(iii)(C), 1910.1052(m)(3)(ii)(A), 1910.1051, appendix B.
1218–0266	Respirable Crystalline Silica Standards for General Industry, Shipyard Employment and Marine Terminals (29 CFR 1910.1053) and Construction (29 CFR 1926.1153).	1910.1053(k)(1)(ii)(G), 1910.1053(k)(3)(ii)(A), 1926.1153(j)(1)(ii)(G), 1926.1153(j)(3)(ii)(A).
1218–0195	Asbestos in Shipyards Standard (29 CFR 1915.1001)	1915.1001(n)(2)(ii)(F), 1915.1001(n)(3)(ii)(A), 1915.1001, appendix D.
1218–0134	Asbestos in Construction (29 CFR 1926.1101)	1926.1101(n)(2)(ii)(F), 1926.1101(n)(3)(ii)(A), 1926.1101, appendix D.
1218–0186	Cadmium in Construction Standard (29 CFR 1926.1127)	1926.1127(d)(2)(iv), 1926.1127(n)(1)(ii)(B), 1926.1127(n)(3)(ii)(A).
1218–0183	4,4′-Methylenedianiline (MDA) in Construction (29 CFR 1926.60).	1926.60(o)(4)(ii)(F), 1926.60(o)(5)(ii)(A).

TABLE 3—ICRS AFFECTED BY SOCIAL SECURITY NUMBER REMOVAL—Continued

OMB control No.	Title	Section modified
1218–0189	Lead in Construction Standard (29 CFR 1926.62)	1926.62(d)(5), 1926.62(n)(1)(ii)(D), 1926.62(n)(2)(ii)(A), 1926.62(n)(3)(ii)(A), 1926.62, appendix B.

In addition to the above-described changes, the agency made adjustments to some ICRs to reflect ongoing PRA interpretations that may result in a minor change to the burden hours and/or costs; these changes are not a result of this rulemaking. For example, the agency has determined that the requirement for employers to make records available upon request to the Assistant Secretary is no longer considered a collection of information. OSHA typically requests access to records during an inspection, and information collected by the agency during the investigation is not subject to the PRA under 5 CFR 1320.4(a)(2). While NIOSH may use records collected from employers for research purposes, the agency does not anticipate that NIOSH will request employers to make available records during the approval period. Therefore, the burden for the employer to make this information available to NIOSH is zero where before the burden may have been one hour.

VII. Federalism

OSHA reviewed this final rule in accordance with the Executive Order on Federalism (Executive Order 13132, 64 FR 43255, August 10, 1999), which requires that Federal agencies, to the extent possible, refrain from limiting State policy options, consult with States prior to taking any actions that would restrict State policy options, and take such actions only when clear constitutional authority exists and the problem is national in scope. Executive Order 13132 provides for preemption of State law only with the express consent of Congress. Agencies must limit any such preemption to the extent possible.

Under section 18 of the OSH Act, Congress expressly provides that States may adopt, with Federal approval, a plan for the development and enforcement of occupational safety and health standards; States that obtain Federal approval for such a plan are referred to as ''State Plans'' (29 U.S.C. 667). Occupational safety and health standards developed by State Plans must be at least as effective in providing safe and healthful employment and places of employment as the Federal standards.

While OSHA drafted this rule to protect employees in every State, Section 18(c)(2) of the OSH Act permits State Plans to develop and enforce their own standards, provided the requirements in these standards are at least as safe and healthful as the requirements specified in this final rule.

In summary, this rule complies with Executive Order 13132. In States without OSHA-approved State Plans, any standard developed from this final rule would limit State policy options in the same manner as every standard promulgated by OSHA. In States with OSHA-approved State Plans, this final rule would not significantly limit State policy options.

VIII. State Plans

When Federal OSHA promulgates a new standard or more stringent amendment to an existing standard, OSHA-approved State Plans must either amend their standards to be ''at least as effective as'' the new standard or amendment, or show that an existing state standard covering this area is already ''at least as effective'' as the new Federal standard or amendment (29 CFR 1953.5(a)). State Plan adoption must be completed within six months of the promulgation date of the final Federal rule. OSHA concludes that this final rule, by revising confusing, outdated, duplicative, or inconsistent standards, will increase the protection afforded to employees while reducing the compliance burden of employers. Therefore, within six months of the rule's promulgation date, State Plans must adopt amendments to their standards that are ''at least as effective,'' unless they demonstrate that such amendments are not necessary because their existing standards are already ''at least as effective'' in protecting workers as this final rule.

The 28 OSHA-approved State Plans are: Alaska, Arizona, California, Connecticut, Hawaii, Illinois, Indiana, Iowa, Kentucky, Maine, Maryland, Michigan, Minnesota, Nevada, New Mexico, New Jersey, New York, North Carolina, Oregon, Puerto Rico, South Carolina, Tennessee, Utah, Vermont, Virginia, Virgin Islands, Washington, and Wyoming. The Connecticut, Illinois, New Jersey, New York, Maine, and the Virgin Islands State Plans cover state and local government employees only, while the rest cover the private sector and state and local government employees.

IX. Unfunded Mandates Reform Act of 1995

OSHA reviewed this final rule in accordance with the Unfunded Mandates Reform Act of 1995 (UMRA) (2 U.S.C. 1501 *et seq.*) and Executive Order 12875 (56 FR 58093). As discussed in section IV (''Final Economic Analysis and Final Regulatory Flexibility Act Analysis'') of this document, the agency determined that this final rule has one revision with estimated annual new costs of $32,440 but all revisions would result in approximately $6.1 million per year in overall (net) cost savings to regulated entities.

The agency's standards do not apply to State and local governments except in States that elect voluntarily to adopt a State Plan approved by the agency. Consequently, this rule does not meet the definition of a ''Federal intergovernmental mandate'' (see section 421(5) of the UMRA (2 U.S.C. 658(5)). Therefore, for the purposes of the UMRA, the agency certifies that this final rule does not mandate that State, local, or tribal governments adopt new, unfunded regulatory obligations, or increase expenditures by the private sector of more than $100 million in any year.

X. Review by the Advisory Committee for Construction Safety and Health

OSHA must consult with the ACCSH whenever the agency proposes a rulemaking that involves the occupational safety and health of construction employees (29 CFR 1911.10, 1912.3). Accordingly, prior to the dates of meetings listed below, OSHA distributed to the ACCSH members for their review a copy of the proposed revisions that applied to construction, as well as a brief summary and explanation of these revisions. At the regular meetings on December 15–16, 2011; May 10–11, 2012; November 29, 2012; March 18, 2013; May 23, 2013; August 22, 2013; May 7–8, 2014; December 3–4, 2014; and December 2, 2015, OSHA staff presented summaries of the material provided to ACCSH members earlier and responded to the members' questions. The ACCSH

subsequently recommended that OSHA publish the proposal.

List of Subjects

29 CFR Part 1904

Recordkeeping.

29 CFR Part 1910

Chest X-ray requirements, Incorporation by reference, Pulmonary—function testing, Social Security numbers on records.

29 CFR Part 1915

Chest X-ray requirements, Incorporation by reference, Sanitation, Social Security numbers on records.

29 CFR Part 1926

Airborne contaminants, Chest X-ray requirements, Coke oven emissions, Diesel equipment, Emergency services, Incorporation by reference, Lanyards, Load limits, Manual on Uniform Traffic Control Devices (MUCTD), Personal protective equipment (PPE), Process safety management (PSM), Roll-over protective structures (ROPs), Social Security numbers on records.

Authority and Signature

Loren Sweatt, Acting Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, authorized the preparation of this document pursuant to Sections 4, 6, and 8 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657), 29 CFR part 1911, and Secretary's Order 1–2012 (77 FR 3912).

Signed at Washington, DC, on April 16, 2019.

Loren Sweatt,

Acting Assistant Secretary of Labor for Occupational Safety and Health.

Amendments to Standards

For the reasons stated in the preamble of this final rule, the Occupational Safety and Health Administration amends 29 CFR parts 1904, 1910, 1915, and 1926 as follows:

PART 1904—RECORDING AND REPORTING OCCUPATIONAL INJURIES AND ILLNESSES

■ 1. Revise the authority citation for part 1904 to read as follows:

Authority: 29 U.S.C. 657, 658, 660, 666, 669, 673, Secretary of Labor's Orders No. 3–2000 (65 FR 50017) and 1–2012 (77 FR 3912), as applicable, and 5 U.S.C. 553.

Subpart C—Recordkeeping Forms and Recording Criteria

■ 2. Revise paragraph (b)(6) of § 1904.10 to read as follows:

§ 1904.10 Recording criteria for cases involving occupational hearing loss.

* * * * *

(b) * * *

(6) *If a physician or other licensed health care professional determines the hearing loss is not work-related, do I still need to record the case?* If a physician or other licensed health care professional determines, following the rules set out in § 1904.5, that the hearing loss is not work-related or that occupational noise exposure did not significantly aggravate the hearing loss, you do not have to consider the case work-related or record the case on the OSHA 300 Log.

* * * * *

PART 1910—OCCUPATIONAL SAFETY AND HEALTH STANDARDS

Subpart A—General

■ 3. The authority citation for part 1910, subpart A, continues to read as follows:

Authority: 29 U.S.C. 653, 655, 657; Secretary of Labor's Order No. 12–71 (36 FR 8754), 8–76 (41 FR 25059), 9–83 (48 FR 35736), 1–90 (55 FR 9033), 6–96 (62 FR 111), 3–2000 (65 FR 50017), 5–2002 (67 FR 65008), 5–2007 (72 FR 31159), 4–2010 (75 FR 55355), or 1–2012 (77 FR 3912), as applicable.

Sections 1910.6, 1910.7, 1910.8, and 1910.9 also issued under 29 CFR 1911. Section 1910.7(f) also issued under 31 U.S.C. 9701, 29 U.S.C. 9a, 5 U.S.C. 553; Public Law 106–113 (113 Stat. 1501A–222); Pub. L. 11–8 and 111–317; and OMB Circular A–25 (dated July 8, 1993) (58 FR 38142, July 15, 1993).

■ 4. Amend § 1910.6 by:

■ a. Revising paragraphs (a)(2) through (4).

■ b. Redesignating paragraphs (i) through (z) as follows:

Old paragraph	New paragraph
(i) through (o)	(j) through (p).
(p) through (x)	(s) through (aa).
(y)	(r).
(z)	(bb).

■ c. Adding new paragraphs (i) and (q).

The revisions and additions read as follows:

§ 1910.6 Incorporation by reference.

(a) * * *

(2) Any changes in the standards incorporated by reference in this part and an official historic file of such changes are available for inspection in the Docket Office at the national office of the Occupational Safety and Health Administration, U.S. Department of Labor, Washington, DC 20210; telephone: 202–693–2350 (TTY number: 877–889–5627).

(3) The standards listed in this section are incorporated by reference into this part with the approval of the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in this section, OSHA must publish a document in the **Federal Register** and the material must be available to the public.

(4) Copies of standards listed in this section and issued by private standards organizations are available for purchase from the issuing organizations at the addresses or through the other contact information listed below for these private standards organizations. In addition, these standards are available for inspection at any Regional Office of the Occupational Safety and Health Administration (OSHA), or at the OSHA Docket Office, U.S. Department of Labor, 200 Constitution Avenue NW, Room N–3508, Washington, DC 20210; telephone: 202–693–2350 (TTY number: 877–889–5627). They are also available for inspection at the National Archives and Records Administration (NARA). For information on the availability of these standards at NARA, telephone: 202–741–6030, or go to *www.archives.gov/federal-register/cfr/ibr-locations.html.*

* * * * *

(i) The following material is available at the American Thoracic Society (ATS), 25 Broadway, 18th Floor New York, NY 10004; website: *www.atsjournals.org/.*

(1) Spirometric Reference Values from a Sample of the General U.S. Population. Hankinson JL, Odencrantz JR, Fedan KB. American Journal of Respiratory and Critical Care Medicine, 159:179–187, 1999, IBR approved for § 1910.1043(h).

(2) [Reserved]

* * * * *

(q) The following material is available from the International Labour Organization (ILO), 4 route des

Morillons, CH–1211 Genève 22, Switzerland; telephone: +41 (0) 22 799 6111; fax: +41 (0) 22 798 8685; website: *www.ilo.org/*.

(1) Guidelines for the Use of the ILO International Classification of Radiographs of Pneumoconioses, Revised Edition 2011, Occupational safety and health series; 22 (Rev.2011), IBR approved for § 1910.1001.

(2) [Reserved]

* * * * *

Subpart Z—Toxic and Hazardous Substances

■ 5. Revise the authority citation for part 1910, subpart Z, to read as follows:

Authority: 29 U.S.C. 653, 655, 657; Secretary of Labor's Order No. 12–71 (36 FR 8754), 8–76 (41 FR 25059), 9–83 (48 FR 35736), 1–90 (55 FR 9033), 6–96 (62 FR 111), 3–2000 (65 FR 50017), or 5–2007 (72 FR 31159), 4–2010 (75 FR 55355) or 1–2012 (77 FR 3912), as applicable; and 29 CFR part 1911.

All of subpart Z issued under 29 U.S.C. 655(b), except those substances that have exposure limits listed in Tables Z–1, Z–2, and Z–3 of § 1910.1000. The latter were issued under 29 U.S.C. 655(a).

Section 1910.1000, Tables Z–1, Z–2 and Z–3 also issued under 5 U.S.C. 553, but not under 29 CFR part 1911 except for the arsenic (organic compounds), benzene, cotton dust, and chromium (VI) listings.

Section 1910.1001 also issued under 40 U.S.C. 3704 and 5 U.S.C. 553.

Section 1910.1002 also issued under 5 U.S.C. 553, but not under 29 U.S.C. 655 or 29 CFR part 1911.

Sections 1910.1018, 1910.1029, and 1910.1200 also issued under 29 U.S.C. 653.

Section 1910.1030 also issued under Public Law 106–430, 114 Stat. 1901.

Section 1910.1201 also issued under 49 U.S.C. 1801–1819 and 5 U.S.C. 553.

■ 6. Amend § 1910.1001 by revising paragraphs (l)(2)(ii) and (l)(3)(ii), the heading to Table 1, and appendices D and E and H, sections III and IV, to read as follows:

§ 1910.1001 Asbestos.

* * * * *

(l) * * *

(2) * * *

(ii) Such examination shall include, as a minimum, a medical and work history; a complete physical examination of all systems with emphasis on the respiratory system, the cardiovascular system and digestive tract; completion of the respiratory disease standardized questionnaire in appendix D to this section, part 1; a 14- by 17-inch or other reasonably-sized standard film or digital posterior-anterior chest X-ray; pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second (FEV_1); and any additional tests deemed appropriate by the examining physician. Classification of all chest X-rays shall be conducted in accordance with appendix E to this section.

(3) * * *

(ii) The scope of the medical examination shall be in conformance with the protocol established in paragraph (l)(2)(ii) of this section, except that the frequency of chest X-rays shall be conducted in accordance with Table 1 to this section, and the abbreviated standardized questionnaire contained in part 2 of appendix D to this section shall be administered to the employee.

Table 1 to § 1910.1001—Frequency of Chest X-ray

* * * * *

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APPENDIX D TO § 1910.1001—MEDICAL QUESTIONNAIRES; MANDATORY

This mandatory appendix contains the medical questionnaires that must be administered to all employees who are exposed to asbestos above the permissible exposure limit, and who will therefore be included in their employer's medical surveillance program. Part 1 of this appendix contains the Initial Medical Questionnaire, which must be obtained for all new hires who will be covered by the medical surveillance requirements. Part 2 includes the abbreviated Periodical Medical Questionnaire, which must be administered to all employees who are provided periodic medical examinations under the medical surveillance provisions of the standard in this section.

Part 1
INITIAL MEDICAL QUESTIONNAIRE

1. NAME_____

2. CLOCK NUMBER_____

3. PRESENT OCCUPATION_____

4. PLANT _____

5. ADDRESS_____

6. _____
(Zip Code)

7. TELEPHONE NUMBER_____

8. INTERVIEWER_____

9. DATE _____

10. Date of Birth _____
Month Day Year

11. Place of Birth _____

12. Sex
1. Male ___
2. Female ___

13. What is your marital status?
1. Single ___
2. Married ___
3. Widowed ___
4. Separated/ Divorced ___

14. Race (Check all that apply)
1. White ___
2. Black or African American ___
3. Asian ___
4. Hispanic or Latino ___
5. American Indian or Alaska Native ___
6. Native Hawaiian or Other Pacific Islander ___

15. What is the highest grade completed in school? _____
(For example 12 years is completion of high school)

OCCUPATIONAL HISTORY

16A. Have you ever worked full time (30 hours per week or more) for 6 months or more? 1. Yes ___ 2. No ___

IF YES TO 16A:

B. Have you ever worked for a year or more in any dusty job? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

Specify job/industry _____ Total Years Worked ___

Was dust exposure: 1. Mild ___ 2. Moderate ___ 3. Severe ___

C. Have you ever been exposed to gas or chemical fumes in your work? 1. Yes ___ 2. No ___

Specify job/industry _____ Total Years Worked ___

Was exposure: 1. Mild ____ 2. Moderate ___ 3. Severe ___

D. What has been your usual occupation or job—the one you have worked at the longest?

1. Job occupation _____

2. Number of years employed in this occupation _____

3. Position/job title _____

4. Business, field or industry _____

(Record on lines the years in which you have worked in any of these industries, e.g. 1960-1969)

Have you ever worked:	YES	NO
E. In a mine?	_____	_____
F. In a quarry?	_____	_____
G. In a foundry?	_____	_____
H. In a pottery?	_____	_____
I. In a cotton, flax or hemp mill?....	_____	_____
J. With asbestos?	_____	_____

17. PAST MEDICAL HISTORY	YES	NO
A. Do you consider yourself to be in good health?	_____	_____
If "NO" state reason _____		
B. Have you any defect of vision?	_____	_____
If "YES" state nature of defect _____		
C. Have you any hearing defect?	_____	_____
If "YES" state nature of defect _____		

	YES	NO
D. Are you suffering from or have you ever suffered from:		
a. Epilepsy (or fits, seizures, convulsions)?	_____	_____
b. Rheumatic fever?	_____	_____
c. Kidney disease?	_____	_____
d. Bladder disease?	_____	_____
e. Diabetes?	_____	_____
f. Jaundice?	_____	_____

18. CHEST COLDS AND CHEST ILLNESSES

18A. If you get a cold, does it "usually" go to your chest? (Usually means more than 1/2 the time)	1. Yes ___ 2. No ___ 3. Don't get colds ___
19A. During the past 3 years, have you had any chest illnesses that have kept you off work, indoors at home, or in bed?	1. Yes ___ 2. No ___

IF YES TO 19A:

B. Did you produce phlegm with any of these chest illnesses?	1. Yes ___ 2. No ___ 3. Does Not Apply ___
C. In the last 3 years, how many such illnesses with (increased) phlegm did you have which lasted a week or more?	Number of illnesses ___ No such illnesses ___
20. Did you have any lung trouble before the age of 16?	1. Yes ___ 2. No ___
21. Have you ever had any of the following?	
1A. Attacks of bronchitis?	1. Yes ___ 2. No ___

IF YES TO 1A:

B. Was it confirmed by a doctor? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

C. At what age was your first attack? Age in Years ___ Does Not Apply ___

2A. Pneumonia (include bronchopneumonia)? 1. Yes ___ 2. No ___

IF YES TO 2A:

B. Was it confirmed by a doctor? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

C. At what age did you first have it? Age in Years ___ Does Not Apply ___

3A. Hay Fever? 1. Yes ___ 2. No ___

IF YES TO 3A:

B. Was it confirmed by a doctor? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

C. At what age did it start? Age in Years ___ Does Not Apply ___

22A. Have you ever had chronic bronchitis? 1. Yes ___ 2. No ___

IF YES TO 22A:

B. Do you still have it? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

C. Was it confirmed by a doctor? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

D. At what age did it start? Age in Years ___ Does Not Apply ___

23A. Have you ever had emphysema? 1. Yes ___ 2. No ___

IF YES TO 23A:

B. Do you still have it? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

C. Was it confirmed by a doctor? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

D. At what age did it start? Age in Years ___ Does Not Apply ___

24A. Have you ever had asthma? 1. Yes ___ 2. No ___

IF YES TO 24A:

B. Do you still have it? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

C. Was it confirmed by a doctor? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

D. At what age did it start? Age in Years ___ Does Not Apply ___

E. If you no longer have it, at what age did it stop? Age stopped ___ Does Not Apply ___

25. Have you ever had:

A. Any other chest illness? 1. Yes ___ 2. No ___

If yes, please specify _____

B. Any chest operations? 1. Yes ___ 2. No ___

If yes, please specify _____

C. Any chest injuries? 1. Yes ___ 2. No ___

If yes, please specify _____

26A. Has a doctor ever told you that you had heart trouble? 1. Yes ___ 2. No ___

IF YES TO 26A:

B. Have you ever had treatment for heart trouble in the past 10 years? — 1. Yes ___ 2. No ___ 3. Does Not Apply ___

27A. Has a doctor told you that you had high blood pressure? — 1. Yes ___ 2. No ___

IF YES TO 27A:

B. Have you had any treatment for high blood pressure (hypertension) in the past 10 years? — 1. Yes ___ 2. No ___ 3. Does Not Apply ___

28. When did you last have your chest X-rayed? (Year) ___ ___ ___ ___

29. Where did you last have your chest X-rayed (if known)? _____

What was the outcome? _____

FAMILY HISTORY

30. Were either of your natural parents ever told by a doctor that they had a chronic lung condition such as:	FATHER			MOTHER		
	1. Yes	2. No	3. Don't know	1. Yes	2. No	3. Don't know
A. Chronic Bronchitis?	___	___	___	___	___	___
B. Emphysema?	___	___	___	___	___	___
C. Asthma?	___	___	___	___	___	___
D. Lung cancer?	___	___	___	___	___	___
E. Other chest conditions?	___	___	___	___	___	___
F. Is parent currently alive?	___	___	___	___	___	___
G. Please Specify	___ Age if Living ___ Age at Death ___ Don't Know			___ Age if Living ___ Age at Death ___ Don't Know		
H. Please specify cause of death	_____			_____		

COUGH

31A. Do you usually have a cough? (Count a cough with first smoke or on first going out of doors. Exclude clearing of throat.) (If no, skip to question 31C.)	1. Yes ___	2. No ___
B. Do you usually cough as much as 4 to 6 times a day 4 or more days out of the week?	1. Yes ___	2. No ___
C. Do you usually cough at all on getting up or first thing in the morning?	1. Yes ___	2. No ___

D. Do you usually cough at all during the rest of the day or at night? 1. Yes ___ 2. No ___

IF YES TO ANY OF ABOVE (31A, B, C, OR D), ANSWER THE FOLLOWING. IF NO TO ALL, CHECK "DOES NOT APPLY" AND SKIP TO NEXT PAGE

E. Do you usually cough like this on most days for 3 consecutive months or more during the year? 1. Yes ___ 2. No ___ 3. Does not apply ___

F. For how many years have you had the cough? Number of years ___ Does not apply ___

32A. Do you usually bring up phlegm from your chest? Count phlegm with the first smoke or on first going out of doors. Exclude phlegm from the nose. Count swallowed phlegm.) (If no, skip to 32C) 1. Yes ___ 2. No ___

B. Do you usually bring up phlegm like this as much as twice a day 4 or more days out of the week? 1. Yes ___ 2. No ___

C. Do you usually bring up phlegm at all on getting up or first thing in the morning? 1. Yes ___ 2. No ___

D. Do you usually bring up phlegm at all on during the rest of the day or at night? 1. Yes ___ 2. No ___

IF YES TO ANY OF THE ABOVE (32A, B, C, OR D), ANSWER THE FOLLOWING:

IF NO TO ALL, CHECK "DOES NOT APPLY" AND SKIP TO 33A

E. Do you bring up phlegm like this on most days for 3 consecutive months or more during the year? 1. Yes ___ 2. No ___ 3. Does not apply ___

F. For how many years have you had trouble with phlegm? Number of years ___ Does not apply ___

EPISODES OF COUGH AND PHLEGM

33A. Have you had periods or episodes of (increased*) cough and phlegm lasting for 3 weeks or more each year?
*(For persons who usually have cough and/or phlegm)

1. Yes ___ 2. No ___

IF YES TO 33A

B. For how long have you had at least 1 such episode per year?

Number of years ___
Does not apply ___

WHEEZING

34A. Does your chest ever sound wheezy or whistling

1. When you have a cold? 1. Yes ___ 2. No ___

2. Occasionally apart from colds? 1. Yes ___ 2. No ___

3. Most days or nights? 1. Yes ___ 2. No ___

B. For how many years has this been present?

Number of years ___
Does not apply ___

35A. Have you ever had an attack of wheezing that has made you feel short of breath? 1. Yes ___ 2. No ___

IF YES TO 35A

B. How old were you when you had your first such attack?

Age in years ___
Does not apply ___

C. Have you had 2 or more such episodes? 1. Yes ___ 2. No ___
3. Does not apply ___

D. Have you ever required medicine or treatment for the(se) attack(s)? 1. Yes ___ 2. No ___
3. Does not apply ___

BREATHLESSNESS

36. If disabled from walking by any condition other than heart or lung disease, please describe and proceed to question 38A.

Nature of condition(s)
_____
_____

37A. Are you troubled by shortness of breath when hurrying on the level or walking up a slight hill?

1. Yes ___ 2. No ___

IF YES TO 37A

B. Do you have to walk slower than people of your age on the level because of breathlessness?

1. Yes ___ 2. No ___
3. Does not apply ___

C. Do you ever have to stop for breath when walking at your own pace on the level?

1. Yes ___ 2. No ___
3. Does not apply ___

D. Do you ever have to stop for breath after walking about 100 yards (or after a few minutes) on the level?

1. Yes ___ 2. No ___
3. Does not apply ___

E. Are you too breathless to leave the house or breathless on dressing or climbing one flight of stairs?

1. Yes ___ 2. No ___
3. Does not apply ___

TOBACCO SMOKING

38A. Have you ever smoked cigarettes?
(No means less than 20 packs of cigarettes or 12 oz. of tobacco in a lifetime or less than 1 cigarette a day for 1 year.)

1. Yes ___ 2. No ___

IF YES TO 38A

B. Do you now smoke cigarettes (as of one month ago)

1. Yes ___ 2. No ___
3. Does not apply ___

C. How old were you when you first started regular cigarette smoking?	Age in years ___ Does not apply ___
D. If you have stopped smoking cigarettes completely, how old were you when you stopped?	Age stopped ___ Check if still smoking ___ Does not apply ___
E. How many cigarettes do you smoke per day now?	Cigarettes per day ___ Does not apply ___
F. On the average of the entire time you smoked, how many cigarettes did you smoke per day?	Cigarettes per day ___ Does not apply ___
G. Do or did you inhale the cigarette smoke?	1. Does not apply ___ 2. Not at all ___ 3. Slightly ___ 4. Moderately ___ 5. Deeply ___
39A. Have you ever smoked a pipe regularly? (Yes means more than 12 oz. of tobacco in a lifetime.)	1. Yes ___ 2. No ___

IF YES TO 39A:
FOR PERSONS WHO HAVE EVER SMOKED A PIPE

B. 1. How old were you when you started to smoke a pipe regularly?	Age ___
2. If you have stopped smoking a pipe completely, how old were you when you stopped?	Age stopped ___ Check if still smoking pipe ___ Does not apply ___

C. On the average over the entire time you smoked a pipe, how much pipe tobacco did you smoke per week?	___ oz. per week (a standard pouch of tobacco contains 1 1/2 oz.) ___ Does not apply
D. How much pipe tobacco are you smoking now?	oz. per week ___ Not currently smoking a pipe ___
E. Do you or did you inhale the pipe smoke?	1. Never smoked ___ 2. Not at all ___ 3. Slightly ___ 4. Moderately ___ 5. Deeply ___

40A. Have you ever smoked cigars regularly? 1. Yes ___ 2. No ___

(Yes means more than 1 cigar a week for a year)

IF YES TO 40A

FOR PERSONS WHO HAVE EVER SMOKED A CIGAR

B. 1. How old were you when you started smoking cigars regularly?	Age ___
2. If you have stopped smoking cigars completely, how old were you when you stopped smoking cigars?	Age stopped ___ Check if still ___ Does not apply ___
C. On the average over the entire time you smoked cigars, how many cigars did you smoke per week?	Cigars per week ___ Does not apply ___
D. How many cigars are you smoking per week now?	Cigars per week ___ Check if not smoking cigars currently ___

E. Do or did you inhale the cigar smoke?	1. Never smoked ___ 2. Not at all ___ 3. Slightly ___ 4. Moderately ___ 5. Deeply ___

Signature _____ Date _____

.

Part 2

PERIODIC MEDICAL QUESTIONNAIRE

1. NAME _____

2. CLOCK NUMBER ___ ___ ___ ___ ___ ___ ___

3. PRESENT OCCUPATION _____

4. PLANT _____

5. ADDRESS _____

6. _____
(Zip Code)

7. TELEPHONE NUMBER _____

8. INTERVIEWER _____

9. DATE _____

10. What is your marital status? 1. Single ___ 2. Married ___ 3. Widowed ___ 4. Separated/ Divorced ___

11. OCCUPATIONAL HISTORY

11A. In the past year, did you work full time (30 hours per week or more) for 6 months or more? 1. Yes ___ 2. No ___

IF YES TO 11A:

11B. In the past year, did you work in a dusty job? 1. Yes ___ 2. No ___ 3. Does not Apply ___

11C. Was dust exposure: 1. Mild ___ 2. Moderate ___ 3. Severe ___

11D. In the past year, were you exposed to gas or chemical fumes in your work? 1. Yes ___ 2. No ___

11E. Was exposure: 1. Mild ___ 2. Moderate ___ 3. Severe ___

11F. In the past year, what was your:
1. Job/occupation? _____
2. Position/job title? _____

12. RECENT MEDICAL HISTORY

12A. Do you consider yourself to be in good health? Yes ___ No ___

If NO, state reason _____

12B. In the past year, have you developed:

	Yes	No
Epilepsy?	___	___
Rheumatic fever?	___	___
Kidney disease?	___	___
Bladder disease?	___	___
Diabetes?	___	___
Jaundice?	___	___
Cancer?	___	___

13. CHEST COLDS AND CHEST ILLNESSES

13A. If you get a cold, does it "usually" go to your chest? (usually means more than 1/2 the time)
1. Yes ___ 2. No ___
3. Don't get colds ___

14A. During the past year, have you had any chest illnesses that have kept you off work, indoors at home, or in bed?
1. Yes ___ 2. No ___
3. Does Not Apply ___

IF YES TO 14A:

14B. Did you produce phlegm with any of these chest illnesses?
1. Yes ___ 2. No ___
3. Does Not Apply ___

14C. In the past year, how many such illnesses with (increased) phlegm did you have which lasted a week or more?
Number of illnesses ___
No such illnesses ___

15. RESPIRATORY SYSTEM

In the past year have you had:

	Yes or No	Further Comment on Positive Answers
Asthma	_____	
Bronchitis	_____	
Hay Fever	_____	
Other Allergies	_____	

	Yes or No	Further Comment on Positive Answers
Pneumonia	_____	
Tuberculosis	_____	
Chest Surgery	_____	
Other Lung Problems	_____	
Heart Disease	_____	

Do you have:

	Yes or No	Further Comment on Positive Answers
Frequent colds	_____	
Chronic cough	_____	
Shortness of breath when walking or climbing one flight or stairs	_____	

Do you:

Wheeze	_____	
Cough up phlegm	_____	
Smoke cigarettes	_____	Packs per day ____ How many years ___

Date _____ Signature _____

BILLING CODE 4510–26–C

Appendix E to § 1910.1001—Classification of Chest X-Rays—Mandatory

(a) Chest X-rays shall be classified in accordance with the Guidelines for the use of the ILO International Classification of Radiographs of Pneumoconioses (revised edition 2011) (incorporated by reference, see § 1910.6), and recorded on a classification form following the format of the CDC/NIOSH (M) 2.8 form. As a minimum, the content within the bold lines of this form (items 1 through 4) shall be included. This form is not to be submitted to NIOSH.

(b) All X-rays shall be classified only by a B-Reader, a board eligible/certified radiologist, or an experienced physician with known expertise in pneumoconioses.

(c) Whenever classifying chest X-ray film, the physician shall have immediately available for reference a complete set of the ILO standard format radiographs provided for use with the Guidelines for the use of the ILO International Classification of Radiographs of Pneumoconioses (revised edition 2011).

(d) Whenever classifying digitally-acquired chest X-rays, the physician shall have immediately available for reference a complete set of ILO standard digital chest radiographic images provided for use with the Guidelines for the Use of the ILO International Classification of Radiographs of Pneumoconioses (revised edition 2011). Classification of digitally-acquired chest X-rays shall be based on the viewing of images displayed as electronic copies and shall not be based on the viewing of hard copy printed transparencies of images.

* * * * *

Appendix H to § 1910.1001—Medical Surveillance Guidelines for Asbestos Non-Mandatory

* * * * *

III. Signs and Symptoms of Exposure-Related Disease

The signs and symptoms of lung cancer or gastrointestinal cancer induced by exposure to asbestos are not unique, except that a chest X-ray of an exposed patient with lung cancer may show pleural plaques, pleural calcification, or pleural fibrosis, and may also show asbestosis (*i.e.,* small irregular parenchymal opacities). Symptoms characteristic of mesothelioma include shortness of breath, pain in the chest or abdominal pain. Mesothelioma has a much longer average latency period compared with lung cancer (40 years versus 15–20 years), and mesothelioma is therefore more likely to

be found among workers who were first exposed to asbestos at an early age. Mesothelioma is a fatal disease.

Asbestosis is pulmonary fibrosis caused by the accumulation of asbestos fibers in the lungs. Symptoms include shortness of breath, coughing, fatigue, and vague feelings of sickness. When the fibrosis worsens, shortness of breath occurs even at rest. The diagnosis of asbestosis is most commonly based on a history of exposure to asbestos, the presence of characteristic radiologic abnormalities, end-inspiratory crackles (rales), and other clinical features of fibrosing lung disease. Pleural plaques and thickening may be observed on chest X-rays. Asbestosis is often a progressive disease even in the absence of continued exposure, although this appears to be a highly individualized characteristic. In severe cases, death may be caused by respiratory or cardiac failure.

IV. Surveillance and Preventive Considerations

As noted in section III of this appendix, exposure to asbestos has been linked to an increased risk of lung cancer, mesothelioma, gastrointestinal cancer, and asbestosis among occupationally exposed workers. Adequate screening tests to determine an employee's potential for developing serious chronic diseases, such as cancer, from exposure to asbestos do not presently exist. However, some tests, particularly chest X-rays and pulmonary function tests, may indicate that an employee has been overexposed to asbestos increasing his or her risk of developing exposure-related chronic diseases. It is important for the physician to become familiar with the operating conditions in which occupational exposure to asbestos is likely to occur. This is particularly important in evaluating medical and work histories and in conducting physical examinations. When an active employee has been identified as having been overexposed to asbestos, measures taken by the employer to eliminate or mitigate further exposure should also lower the risk of serious long-term consequences.

The employer is required to institute a medical surveillance program for all employees who are or will be exposed to asbestos at or above the permissible exposure limit (0.1 fiber per cubic centimeter of air). All examinations and procedures must be performed by or under the supervision of a licensed physician, at a reasonable time and place, and at no cost to the employee.

Although broad latitude is given to the physician in prescribing specific tests to be included in the medical surveillance program, OSHA requires inclusion of the following elements in the routine examination:

(i) Medical and work histories with special emphasis directed to symptoms of the respiratory system, cardiovascular system, and digestive tract.

(ii) Completion of the respiratory disease questionnaire contained in appendix D of this section.

(iii) A physical examination including a chest X-ray and pulmonary function test that includes measurement of the employee's forced vital capacity (FVC) and forced expiratory volume at one second (FEV_1).

(iv) Any laboratory or other test that the examining physician deems by sound medical practice to be necessary.

The employer is required to make the prescribed tests available at least annually to those employees covered; more often than specified if recommended by the examining physician; and upon termination of employment.

The employer is required to provide the physician with the following information: A copy of the standard in this section (including all appendices to this section); a description of the employee's duties as they relate to asbestos exposure; the employee's representative level of exposure to asbestos; a description of any personal protective and respiratory equipment used; and information from previous medical examinations of the affected employee that is not otherwise available to the physician. Making this information available to the physician will aid in the evaluation of the employee's health in relation to assigned duties and fitness to wear personal protective equipment, if required.

The employer is required to obtain a written opinion from the examining physician containing the results of the medical examination; the physician's opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of exposure-related disease; any recommended limitations on the employee or on the use of personal protective equipment; and a statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions related to asbestos exposure that require further explanation or treatment. This written opinion must not reveal specific findings or diagnoses unrelated to exposure to asbestos, and a copy of the opinion must be provided to the affected employee.

* * * * *

■ 7. Amend § 1910.1018 by revising paragraphs (n)(2)(ii)(A) and (n)(3)(i) and (ii), appendix A, section VI, and appendix C, section I, to read as follows:

§ 1910.1018 Inorganic arsenic.

* * * * *

(n) * * *

(2) * * *

(ii) * * *

(A) A standard film or digital posterior-anterior chest X-ray;

* * * * *

(3) * * *

(i) Examinations must be provided in accordance with paragraphs (n)(2)(i) and (n)(2)(ii)(B) and (C) of this section at least annually.

(ii) Whenever a covered employee has not taken the examinations specified in paragraphs (n)(2)(i) and (n)(2)(ii)(B) and (C) of this section within six (6) months preceding the termination of employment, the employer shall provide such examinations to the employee upon termination of employment.

* * * * *

Appendix A to § 1910.1018—Inorganic Arsenic Substance Information Sheet

* * * * *

VI. Medical Examinations

If your exposure to arsenic is over the Action Level (5 µg/m3)—(including all persons working in regulated areas) at least 30 days per year, or you have been exposed to arsenic for more than 10 years over the Action Level, your employer is required to provide you with a medical examination. The examination shall be every 6 months for employees over 45 years old or with more than 10 years exposure over the Action Level and annually for other covered employees. The medical examination must include a medical history; a chest X-ray (during initial examination only); skin examination and a nasal examination. The examining physician will provide a written opinion to your employer containing the results of the medical exams. You should also receive a copy of this opinion. The physician must not tell your employer any conditions he detects unrelated to occupational exposure to arsenic but must tell you those conditions.

* * * * *

Appendix C to § 1910.1018—Medical Surveillance Guidelines

I. General

Medical examinations are to be provided for all employees exposed to levels of inorganic arsenic above the action level (5 µg/m3) for at least 30 days per year (which would include among others, all employees, who work in regulated areas). Examinations are also to be provided to all employees who have had 10 years or more exposure above the action level for more than 30 days per year while working for the present or predecessor employer though they may no longer be exposed above the level.

An initial medical examination is to be provided to all such employees by December 1, 1978. In addition, an initial medical examination is to be provided to all employees who are first assigned to areas in which worker exposure will probably exceed 5 µg/m3 (after August 1, 1978) at the time of initial assignment. In addition to its immediate diagnostic usefulness, the initial examination will provide a baseline for comparing future test results. The initial examination must include as a minimum the following elements:

(1) A work and medical history, including a smoking history, and presence and degree of respiratory symptoms such as breathlessness, cough, sputum production, and wheezing;

(2) A 14″ by 17″ or other reasonably-sized standard film or digital posterior-anterior chest X-ray;

(3) A nasal and skin examination; and

(4) Other examinations which the physician believes appropriate because of the employee's exposure to inorganic arsenic or because of required respirator use.

Periodic examinations are also to be provided to the employees listed in the first paragraph of this section. The periodic examinations shall be given annually for those covered employees 45 years of age or less with fewer than 10 years employment in areas where employee exposure exceeds the action level (5 $\mu g/m^3$). Periodic examinations need not include sputum cytology or chest X-ray and only an updated medical history is required.

Periodic examinations for other covered employees shall be provided every six (6) months. These examinations shall include all tests required in the initial examination, except the chest X-ray, and the medical history need only be updated.

The examination contents are minimum requirements. Additional tests such as lateral and oblique X-rays or pulmonary function tests may be useful. For workers exposed to three arsenicals which are associated with lymphatic cancer, copper acetoarsenite, potassium arsenite, or sodium arsenite the examination should also include palpation of superficial lymph nodes and complete blood count.

* * * * *

■ 8. Amend § 1910.1027 by revising paragraph (l)(4)(ii)(C) and appendix D to read as follows:

§ 1910.1027 Cadmium.

* * * * *

(l) * * *

(4) * * *

(ii) * * *

(C) A 14 inch by 17 inch or other reasonably-sized standard film or digital posterior-anterior chest X-ray (after the initial X-ray, the frequency of chest X-rays is to be determined by the examining physician);

* * * * *

BILLING CODE 4510–26–P

APPENDIX D TO § 1910.1027—OCCUPATIONAL HEALTH HISTORY INTERVIEW WITH REFERENCE TO CADMIUM EXPOSURE

Directions

(To be read by employee and signed prior to the interview)

Please answer the questions you will be asked as completely and carefully as you can. These questions are asked of everyone who works with cadmium. You will also be asked to give blood and urine samples. The doctor will give your employer a written opinion on whether you are physically capable of working with cadmium. Legally, the doctor cannot share personal information you may tell him/her with your employer. The following information is considered strictly confidential. The results of the tests will go to you, your doctor and your employer. You will also receive an information sheet explaining the results of any biological monitoring or physical examinations performed. If you are just being hired, the results of this interview and examination will be used to:

(1) Establish your health status and see if working with cadmium might be expected to cause unusual problems,

(2) Determine your health status today and see if there are changes over time,

(3) See if you can wear a respirator safely.

If you are not a new hire:

OSHA says that everyone who works with cadmium can have periodic medical examinations performed by a doctor. The reasons for this are:

a) If there are changes in your health, either because of cadmium or some other reason, to find them early,

b) to prevent kidney damage.

Please sign below.

I have read these directions and understand them:

_____
Employee signature

_____
Date

Thank you for answering these questions. (Suggested Format)

Name_____

Age _____

Company_____

Job_____

Type of Preplacement Exam:

[ ] Periodic

[ ] Termination

[ ] Initial

[ ] Other

Blood Pressure_____

Pulse Rate_____

1. How long have you worked at the job listed above?
   [ ] Not yet hired

   [ ] Number of months

   [ ] Number of years

2. Job Duties etc.

_____

_____

_____

3. Have you ever been told by a doctor that you had bronchitis?
   [ ] Yes
   [ ] No

   If yes, how long ago?
   [ ] Number of months
   [ ] Number of years

4. Have you ever been told by a doctor that you had emphysema?
   [ ] Yes
   [ ] No

   If yes, how long ago?
   [ ] Number of years
   [ ] Number of months

5. Have you ever been told by a doctor that you had other lung problems?
   [ ] Yes
   [ ] No

   If yes, please describe type of lung problems and when you had these problems.

_____

_____

_____

6. In the past year, have you had a cough?
   [ ] Yes
   [ ] No

   If yes, did you cough up sputum?
   [ ] Yes
   [ ] No

   If yes, how long did the cough with sputum production last?
   [ ] Less than 3 months
   [ ] 3 months or longer

   If yes, for how many years have you had episodes of cough with sputum production lasting this long?
   [ ] Less than one
   [ ] 1
   [ ] 2
   [ ] Longer than 2

7. Have you ever smoked cigarettes?
   [ ] Yes
   [ ] No

8. Do you now smoke cigarettes?
   [ ] Yes
   [ ] No

9. If you smoke or have smoked cigarettes, for how many years have you smoked, or did you smoke?
   [ ] Less than 1 year
   [ ] Number of years

What is or was the greatest number of packs per day that you have smoked?

[ ] Number of packs

If you quit smoking cigarettes, how many years ago did you quit?

[ ] Less than 1 year

[ ] Number of years

How many packs a day do you now smoke?

[ ] Number of packs per day

10. Have you ever been told by a doctor that you had a kidney or urinary tract disease or disorder?

[ ] Yes

[ ] No

11. Have you ever had any of these disorders?

Kidney stones.....[ ] Yes [ ] No

Protein in urine.....[ ] Yes [ ] No

Blood in urine .....[ ] Yes [ ] No

Difficulty urinating.....[ ] Yes [ ] No

Other kidney/Urinary disorders.....[ ] Yes [ ] No

Please describe problems, age, treatment, and follow up for any kidney or urinary problems you have had:

_____

_____

_____

12. Have you ever been told by a doctor or other health care provider who took your blood pressure that your blood pressure was high?

[ ] Yes

[ ] No

13. Have you ever been advised to take any blood pressure medication?

[ ] Yes

[ ] No

14. Are you presently taking any blood pressure medication?

[ ] Yes

[ ] No

15. Are you presently taking any other medication?

[ ] Yes

[ ] No

16. Please list any blood pressure or other medications and describe how long you have been taking each one:

Medicine	How long Taken

17. Have you ever been told by a doctor that you have diabetes? (sugar in your blood or urine)

[ ] Yes

[ ] No

If yes, do you presently see a doctor about your diabetes?

[ ] Yes

[ ] No

If yes, how do you control your blood sugar?

[ ] Diet alone

[ ] Diet plus oral medicine

[ ] Diet plus insulin (injection)

18. Have you ever been told by a doctor that you had:

Anemia	[ ] Yes	[ ] No
A low blood count?	[ ] Yes	[ ] No

19. Do you presently feel that you tire or run out of energy sooner than normal or sooner than other people your age?

[ ] Yes

[ ] No

If yes, for how long have you felt that you tire easily?

[ ] Less than 1 year

[ ] Number of years

20. Have you given blood within the last year?

[ ] Yes

[ ] No

If yes, how many times?

[ ] Number of times

How long ago was the last time you gave blood?

[ ] Less than 1 month

[ ] Number of months

21. Within the last year have you had any injuries with heavy bleeding?

[ ] Yes

[ ] No

If yes, how long ago?

[ ] Less than 1 month

[ ] Number of months

Describe: _____

_____

_____

22. Have you recently had any surgery?

[ ] Yes

[ ] No

If yes, please describe: _____

_____

_____

23. Have you seen any blood lately in your stool or after a bowel movement?

[ ] Yes

[ ] No

24. Have you ever had a test for blood in your stool?

[ ] Yes

[ ] No

If yes, did the test show any blood in the stool?

[ ] Yes

[ ] No

What further evaluation and treatment were done? _____

_____

_____

_____

_____

The following questions pertain to the ability to wear a respirator.
Additional information for the physician can be found in The Respiratory Protective Devices Manual.

25. Have you ever been told by a doctor that you have asthma?

[ ] Yes

[ ] No

If yes, are you presently taking any medication for asthma? Mark all that apply.

[ ] Shots

[ ] Pills

[ ] Inhaler

26. Have you ever had a heart attack?

[ ] Yes

[ ] No

If yes, how long ago?

[ ] Number of years

[ ] Number of months

27. Have you ever had pains in your chest?

[ ] Yes

[ ] No

If yes, when did it usually happen?

[ ] While resting

[ ] While working

[ ] While exercising

[ ] Activity didn't matter

28. Have you ever had a thyroid problem?

[ ] Yes

[ ] No

29. Have you ever had a seizure or fits?

[ ] Yes

[ ] No

30. Have you ever had a stroke (cerebrovascular accident)?

[ ] Yes

[ ] No

31. Have you ever had a ruptured eardrum or a serious hearing problem?

[ ] Yes

[ ] No

32. Do you now have a claustrophobia, meaning fear of crowded or closed in spaces or any psychological problems that would make it hard for you to wear a respirator?

[ ] Yes

[ ] No

The following questions pertain to reproductive history.

33. Have you or your partner had a problem conceiving a child?

[ ] Yes

[ ] No

If yes, specify:

[ ] Self

[ ] Present mate

[ ] Previous mate

34. Have you or your partner consulted a physician for a fertility or other reproductive problem?

[ ] Yes

[ ] No

If yes, specify who consulted the physician:

[ ] Self

[ ] Spouse/partner

[ ] Self and partner

If yes, specify diagnosis made: _____

_____

_____

_____

_____

35. Have you or your partner ever conceived a child resulting in a miscarriage, still birth or a child with malformations or birth defects?

[ ] Yes

[ ] No

If yes, specify:

[ ] Miscarriage

[ ] Still birth

[ ] Malformations or birth defects

If outcome was a child with malformations or birth defects, please specify type:

_____

_____

36. Was this outcome a result of a pregnancy of:

[ ] Yours with present partner

[ ] Yours with a previous partner

37. Did the timing of any abnormal pregnancy outcome coincide with present employment?

[ ] Yes

[ ] No

List dates of occurrences: _____

_____

_____

38. What is the occupation of your spouse or partner?

_____

_____

For Women Only

39. Do you have menstrual periods?

[ ] Yes

[ ] No

Have you had menstrual irregularities?

[ ] Yes

[ ] No

If yes, specify type: _____

_____

_____

If yes, what was the approximated date this problem began? _____

_____

Approximate date problem stopped? _____

_____

For Men Only

40. Have you ever been diagnosed by a physician as having prostate gland problem(s)?

[ ] Yes

[ ] No

If yes, please describe type of problem(s) and what was done to evaluate and treat the problem(s): _____

_____

_____

BILLING CODE 4510–26–C

* * * * *

■ 9. Amend § 1910.1029 by revising paragraphs (j)(2)(ii) and (j)(3), appendix A, section VI, and appendix B, section II(A), to read as follows:

§ 1910.1029 Coke oven emissions.

* * * * *

(j) * * *

(2) * * *

(ii) A 14- by 17-inch or other reasonably-sized standard film or digital posterior-anterior chest X-ray;

* * * * *

(3) *Periodic examinations.* (i) The employer shall provide the examinations specified in paragraphs (j)(2)(i) and (iii) through (vi) of this section at least annually for employees covered under paragraph (j)(1)(i) of this section.

(ii) The employer must provide the examinations specified in paragraphs (j)(2)(i) and (iii) through (vii) of this section at least annually for employees 45 years of age or older or with five (5) or more years employment in the regulated area.

(iii) Whenever an employee who is 45 years of age or older or with five (5) or more years employment in a regulated area transfers or is transferred from employment in a regulated area, the employer must continue to provide the examinations specified in paragraphs (j)(2)(i) and (iii) through (vii) of this section at least annually as long as that employee is employed by the same employer or a successor employer.

* * * * *

Appendix A to § 1910.1029—Coke Oven Emissions Substance Information Sheet

* * * * *

VI. Medical Examinations

If you work in a regulated area at least 30 days per year, your employer is required to provide you with a medical examination every year. The initial medical examination must include a medical history, a chest X-ray, pulmonary function test, weight comparison, skin examination, a urinalysis, and a urine cytology exam for early detection of urinary cancer. Periodic examinations shall include all tests required in the initial examination, except that (1) the x-ray is to be performed during initial examination only and (2) the urine cytologic test is to be performed only on those employees who are 45 years or older or who have worked for 5 or more years in the regulated area. The examining physician will provide a written opinion to your employer containing the results of the medical exams. You should also receive a copy of this opinion.

* * * * *

Appendix B to § 1910.1029—Industrial Hygiene and Medical Surveillance Guidelines

* * * * *

II. Medical Surveillance Guidelines

A. *General.* The minimum requirements for the medical examination for coke oven workers are given in the standard in paragraph (j) of this section. The initial examination is to be provided to all coke oven workers who work at least 30 days in the regulated area. The examination includes a 14″ by 17″ or other reasonably-sized standard film or digital posterior-anterior chest X-ray reading, pulmonary function tests (FVC and FEV_1), weight, urinalysis, skin examination, and a urinary cytologic examination. These tests are needed to serve as the baseline for comparing the employee's future test results. Periodic exams include all the elements of the initial exams, except that (1) the x-ray is to be performed during initial examination only and (2) the urine cytologic test is to be performed only on those employees who are 45 years or older or who have worked for 5 or more years in the regulated area. The examination contents are minimum requirements; additional tests such as lateral and oblique X-rays or additional pulmonary function tests may be performed if deemed necessary.

* * * * *

■ 10. Amend § 1910.1043 by:

■ a. Revising paragraphs (h)(2)(iii), (h)(3)(ii), and (n)(1) and appendices B–I, B–II, and B–III; and

■ b. Removing and reserving appendix C; and

■ c. Revising appendix D.

The revisions read as follows:

§ 1910.1043 Cotton dust.

* * * * *

(h) * * *

(2) * * *

(iii) A pulmonary function measurement, including forced vital capacity (FVC) and forced expiratory volume in one second (FEV_1), and determination of the FEV_1/FVC ratio shall be made. FVC, FEV_1, and FEV_1/FVC ratio values shall be compared to appropriate race/ethnicity-specific Lower Limit of Normal (LLN) values and predicted values published in Spirometric Reference Values from a Sample of the General U.S. Population, American Journal of Respiratory and Critical Care Medicine, 159(1): 179–187, January 1999 (commonly known as the NHANES III reference data set) (incorporated by reference, see § 1910.6). To obtain reference values for Asian-Americans, Spirometric Reference Values FEV_1 and FVC predicted and LLN values for Caucasians shall be multiplied by 0.88 to adjust for ethnic differences. These determinations shall be made for each employee before the employee enters the workplace on the first day of the work week, preceded by at least 35 hours of no exposure to cotton dust. The tests shall be repeated during the shift, no less than 4 and no more than 10 hours after the beginning of the work shift; and, in any event, no more than one hour after cessation of exposure. Such exposure shall be typical of the employee's usual workplace exposure.

* * * * *

(3) * * *

(ii) Medical surveillance as required in paragraph (h)(3)(i) of this section shall be provided every six months for all employees in the following categories:

(A) An FEV_1 greater than the LLN, but with an FEV_1 decrement of 5 percent or 200 ml. on a first working day;

(B) An FEV_1 of less than the LLN; or

(C) Where, in the opinion of the physician, any significant change in questionnaire findings, pulmonary function results, or other diagnostic tests have occurred.

* * * * *

(n) * * *

(1) Appendices B and D of this section are incorporated as part of this section and the contents of these appendices are mandatory.

* * * * *

BILLING CODE 4510–26–P

APPENDIX B-I -- RESPIRATORY QUESTIONNAIRE

RESPIRATORY QUESTIONNAIRE

A. IDENTIFICATION DATA

PLANT _____

DAY MONTH YEAR

(figures) (last 2 digits)

NAME _____ DATE OF INTERVIEW _____

(Surname)

_____ DATE OF BIRTH _____

(First Names)

M F

ADDRESS _____ AGE ____ (8, 9) SEX _____(10)

RACE (11) (Check all that apply)

1. White ___
2. Black or African American ___
3. Asian ___
4. Hispanic or Latino ___
5. American Indian or Alaska Native ___
6. Native Hawaiian or Other Pacific Islander ___

INTERVIEWER: 1 2 3 4 5 6 7 8 (12)

WORK SHIFT: 1st _____ 2nd _____ 3rd _____ (13)

STANDING HEIGHT _____ (14, 15)

WEIGHT _____ (16, 18)

PRESENT WORK AREA

If working in more than one specified work area, X area where most of the work shift is spent. If "other," but spending 25% of the work shift in one of the specified work areas, classify in that work area. If carding department employee, check area within that department where most of the work shift is spent (if in doubt, check "throughout"). For work areas such as spinning and weaving where many work rooms may be involved, be sure to check to specific work room to which the employee is assigned - if he works in more than one work room within a department classify as 7 (all) for that department.

	Work-room Number	(19) Open	(20) Pick	Area	(21) Card #1	(22) #2	(23) Spin	(24) Wind	(25) Twist
AT RISK (cotton & cotton blend)	1			Cards					
	2			Draw					
	3			Comb					
	4			Thru Out					
	5								
	6								
	7 (all)								
Control (synthe-tic & wo ol)	8								
Ex-Worker (cotton)	9								

Continued –

	Work-Room Number	(26) Spool	(27) Warp	(28) Slash	(29) Weave	(30) Other
AT RISK (cotton & cotton blend)	1					
	2					
	3					
	4					
	5					
	6					
	7 (all)					
Control (synthetic & wool)	8					
Ex-Worker (cotton)	9					

Use actual wording of each question. Put X in appropriate square after each question. When in doubt record "No". When no square, circle appropriate answer.

B. COUGH

(on getting up)
Do you usually cough first thing in the morning? _____

Yes _____ No _____ (31)

(Count a cough with first smoke or on "first going out of doors." Exclude clearing throat or a single cough.)

Do you usually cough during the day or at night? Yes _____ No _____ (32)

(Ignore an occasional cough.)

If `Yes' to either question (31-32):

Do you cough like this on most days for as much as three months a year? Yes _____ No _____ (33)

Do you cough on any particular day of the week? Yes _____ No _____ (34)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
If 'Yes': Which day?	Mon	Tues	Wed	Thur	Fri	Sat	Sun	(35)

C. PHLEGM or alternative word to suit local custom.

(on getting up)

Do you usually bring up any phlegm from your chest first thing in the morning? (Count phlegm with the first smoke or on "first going out of doors." Exclude phlegm from the nose. Count swallowed phlegm.) Yes _____ No _____ (36)

Do you usually bring up any phlegm from your chest during the day or at night? (Accept twice or more.) Yes _____ No _____ (37)

If `Yes' to question (36) or (37):

Do you bring up any phlegm like this on most days for as much as three months each year? Yes _____ No _____ (38)

If `Yes' to question (33) or (38):

(cough)

How long have you had this phlegm?

(Write in number of years)

(1) ____ 2 years or less (39)

(2) ____ More than 2 year-9 years

(3) ____ 10-19 years

(4) ____ 20+ years

* These words are for subjects who work at night

D. CHEST ILLNESSES

In the past three years, have you had a period of (increased) *cough and phlegm lasting for 3 weeks or more?

(1) ____ No (40)

(2) ____ Yes, only one period

(3) ____ Yes, two or more periods

*For subjects who usually have phlegm

During the past 3 years have you had any chest illness which has kept you off work, indoors at home or in bed? (For as long as one week, flu?)

Yes _____ No _____ (41)

If `Yes' to (41):

Did you bring up (more) phlegm than usual in any of these illnesses?

Yes _____ No _____ (42)

If `Yes' to (42):

During the past three years have you had:

Only one such illness with increased phlegm? (1) _____ (43)

More than one such illness: (2) _____(44)

Br. Grade _____

E. TIGHTNESS

Does your chest ever feel tight or your breathing become difficult?

Yes _____ No _____ (45)

Is your chest tight or your breathing difficult on any particular day of the week? (after a week or 10 days from the mill)

Yes _____ No _____ (46)

If `Yes': Which day? (3) (4) (5) (6) (7) (8)

Mon. ^ Tues. Wed. Thur. Fri. Sat. Sun. (47)

(1) / \ (2)

Sometimes Always

If `Yes' Monday: At what time on Monday does your chest feel tight or your breathing difficult?

(1) ___ Before entering the mill (48)

(2) ___ After entering the mill

(Ask only if NO to Question (45))

In the past, has your chest ever been tight or your breathing difficult on any particular day of the week?

Yes _____ No _____ (49)

If `Yes': Which day? (3) (4) (5) (6) (7) (8)

Mon. ^ Tues. Wed. Thur. Fri. Sat. Sun. (50)

(1) / \ (2)

Sometimes Always

F. BREATHLESSNESS

If disabled from walking by any condition other than heart or lung disease put "X" here and leave questions (52-60) unasked. _____(51)

Are you ever troubled by shortness of breath, when hurrying on the level or walking up a slight hill? Yes _____ No _____ (52)

If `No', grade is 1.

If `Yes', proceed to next question.

Do you get short of breath walking with other people at an ordinary pace on the level? Yes _____ No _____ (53)

If `No', grade is 2.

If `Yes', proceed to next question.

Do you have to stop for breath when walking at your own pace on the level? Yes _____ No _____ (54)

If `No', grade is 3.

If `Yes', proceed to next question.

Are you short of breath on washing or dressing? Yes _____ No _____ (55)

If `No', grade is 4.

If `Yes' grade is 5.

Dyspnea Grd. _____ (56)

ON MONDAYS

Are you ever troubled by shortness of breath, when hurrying on the level or walking up a slight hill? Yes _____ No _____ (57)

If `No', grade is 1.

If `Yes', proceed to next question.

Do you get short of breath walking with other people at ordinary pace on the level? Yes _____ No _____ (58)

If `No', grade is 2.

If `Yes', proceed to next question.

Do you have to stop for breath when walking at your own pace on level ground? Yes _____ No _____ (59)

If `No', grade is 3.

If `Yes', proceed to next question.

Are you short of breath on washing or dressing? Yes _____ No _____ (60)

If `No', grade is 4.

If `Yes', grade is 5. B. Grd. _____ (61)

G. OTHER ILLNESSES AND ALLERGY HISTORY

Do you have a heart condition for which you are under a doctor's care?

Yes _____ No _____ (62)

Have you ever had asthma? Yes _____ No _____ (63)

If `Yes', did it begin: (1) _____ Before age 30

(2) _____ After age 30

If `Yes' before 30 did you have asthma before ever going to work in a textile mill? Yes _____ No _____ (64)

Have you ever had hay fever or other allergies (other than above)? Yes _____ No _____ (65)

H. TOBACCO SMOKING*

Do you smoke?

Record `Yes', if regular smoker up to one month ago (Cigarettes, cigar or pipe) Yes _____ No _____ (66)

If `No' to (63)

Have you ever smoked? (Cigarettes, cigars, pipe. Record `No' if subject has never smoked as much as one cigarette a day, or 1 oz of tobacco a month, for as long as one year.) Yes _____ No _____ (67)

If `Yes' to (63) or (64), what have you smoked and for how many years?

(Write in specific number of years in the appropriate square)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
Years	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	>40	
Cigarettes										(68)
Pipe										(69)
Cigars										(70)

If cigarettes, how many packs per day? (Write in number of cigarettes)

(1) _____ Less than 1/2 pack (71)

(2) _____ 1/2 pack, but less than 1 pack

(3) _____ 1 pack, but less than 1 ½ packs

(4) _____ 1 1/2 packs or more

Number of years _____ (72, 73)

If an ex-smoker (cigarettes, cigar or pipe), how long since you stopped?
(Write in number of years) _____ (74)

(1) _____ 0-1 year

(2) _____ 1-4 years

(3) _____ 5-9 years

(4) _____ 10+ years

* Have you changed your smoking habits since last interview? If yes, specify what changes.

I. OCCUPATIONAL HISTORY**

Have you ever worked in:

A foundry? (As long as one year) Yes _____ No _____ (75)

Stone or mineral mining, quarry or processing? (As long as one year) Yes _____ No _____ (76)

Asbestos milling or processing? Yes _____ No _____ (77)

Other dusts, fumes or smoke? Yes _____ No _____ (78)

If yes, specify.

Type of exposure _____

Length of exposure _____

** Ask only on first interview.

At what age did you first go to work in a textile mill?

(Write in specific age in appropriate square)

(1)	(2)	(3)	(4)	(5)	(6)
<20	20-24	25-29	30-34	35-39	40+

When you first worked in a textile mill, did you work with:

(1) _____ Cotton or cotton blend (79)

(2) _____ Synthetic or wool (80)

APPENDIX B-II -- RESPIRATORY QUESTIONNAIRE FOR NON-TEXTILE WORKERS FOR THE COTTON INDUSTRY

Respiratory Questionnaire for Non-Textile Workers for the Cotton Industry

Identification No. Interviewer Code

Location Date of Interview

A. IDENTIFICATION

1. NAME (Last) (First) (Middle Initial)

2. CURRENT ADDRESS (Number, Street, or Rural Route, City or Town, County, State, Zip Code)

3. PHONE NUMBER AREA CODE NO.

(__ __ __) ___ ___ ___ - ___ ___ ___ ___

4. BIRTHDATE (Mo., Day, Yr.)

5. SEX

1. _____ Male 2. _____ Female

6. ETHNIC GROUP OR ANCESTRY (Check all that apply)

1. ____ White
2. ____ Black or African American
3. ____ Asian

4. ____ Hispanic or Latino
5. ____ American Indian or Alaska Native
6. ____ Native Hawaiian or Other Pacific Islander

7. STANDING HEIGHT

_____ (in)

8. WEIGHT (lbs)

_____

9. WORK SHIFT

1st _____ 2nd _____ 3rd _____

10. PRESENT WORK AREA

Please indicate primary assigned work area and percent of time spent at that site. If at other locations, please indicate and note percent of time for each.

PRIMARY WORK AREA	
SPECIFIC JOB	

11. APPROPRIATE INDUSTRY

1. _____ Garnetting
2. _____ Cottonseed Oil Mill
3. _____ Cotton Warehouse
4. _____ Utilization
5. _____ Cotton Classification
6. _____ Cotton Ginning

B. OCCUPATIONAL HISTORY TABLE

Complete the following table showing the entire work history of the individual from present to initial employment. Sporadic, part-time periods of employment, each of no significant duration, should be grouped if possible.

INDUSTRY AND LOCATION	TENURE OF EMPLOYMENT		SPECIFIC OCCUPATION	AVERAGE NO. DAYS WORKED PER WEEK	HAZARDOUS HEALTH EXPOSURE ASSOCIATED WITH WORK		
	FROM (year)	TO (year)			YES	NO	IF YES, DESCRIBE

C. SYMPTOMS

Use actual wording of each question. Put X in appropriate square after each question. When in doubt record "No.".

COUGH

1. Do you usually cough first thing in the morning? (on getting up)* (Count a cough with first smoke or on "first going out of doors". Exclude clearing throat or a single cough.) 1._____Yes 2._____No

2. Do you usually cough during the day or at night? (Ignore an occasional cough.) 1. ____ Yes 2. ____ No

If YES to either 1 or 2:

3. Do you cough like this on days for as much as three months a year?	1. ____ Yes 2. ____ No 3. ____ NA
4. Do you cough on any particular day of the week?	1. ____ Yes 2. _____ No

If YES:

5. Which day?	Mon. Tue. Wed. Thur. Fri. Sat. Sun. _____

PHLEGM

6. Do you usually bring up any phlegm from your chest first thing in the morning? (on getting up)* (Count phlegm with the first smoke or on "first going out of doors." Exclude phlegm from the nose. Count swallowed phlegm.	1. ____ Yes 2. ____ No
7. Do you usually bring up any phlegm from your chest during the day or at night? (Accept twice or more.)	1. ____ Yes 2. ____ No

If YES to either question 6 or 7:

8. Do you bring up phlegm like this on most days for as much as three months each year?	1. ____ Yes 2. ____ No

If YES to question 3 or 8:

9. How long have you had this phlegm? (cough) (Write in number of years)	(1) ____ 2 years or less (2) ____ More than 2 years - 9 years (3) ____ 10-19 years (4) ____ 20+ years

* These words are for subjects who work at night.

CHEST ILLNESS

10. In the past three years, have you had a period of (increased) cough and phlegm lasting for 3 weeks or more?	(1) ____ No (2) ____ Yes, only one period (3) ____ Yes, two or more periods

For subjects who usually have phlegm:

11. During the past 3 years have you had any chest illness which has kept you off work, indoors at home or in bed? (For as long as one week, flu?)	1. ____ Yes 2. ____ No

If YES to 11:

12. Did you bring up (more) phlegm than usual in any of these illnesses?	1. ____ Yes 2. ____ No
13. Only one such illness with increased phlegm?	1. ____ Yes 2. ____ No

If YES to 12: During the past three years have you had:

14. More than one such illness:	1. ____ Yes 2. ____ No

Br. Grade _____

TIGHTNESS

15. Does your chest ever feel tight or your breathing become difficult? 1. ____ Yes 2. ____ No

16. Is your chest tight or your breathing difficult on any particular day of the week? (after a week or 10 days away from the mill) 1. ____ Yes 2. ____ No

17. If `Yes': Which day?

(3) Mon. ^ (4) Tues. (5) Wed. (6) Thur. (7) Fri. (8) Sat. Sun.

(1) / Sometimes \ (2) Always

18. If YES Monday: At what time on Monday does your chest feel tight or your breathing difficult?

_____ Before entering mill

_____ After entering mill

(Ask only if NO to Question (15))

19. In the past, has your chest ever been tight or your breathing difficult on any particular day of the week? 1. ____ Yes 2. ____ No

20. If `Yes': Which day?

(3) Mon. ^ (4) Tues. (5) Wed. (6) Thur. (7) Fri. (8) Sat. Sun.

(1) / Sometimes \ (2) Always

BREATHLESSNESS

21. If disabled from walking by any condition other than heart or lung disease put "X" in the space and leave questions (22-30) unasked. _____

22. Are you ever troubled by shortness of breath, when hurrying on the level or

walking up a slight hill? 1. ____ Yes 2. ____ No

If NO, grade is 1. If YES, proceed to next question.

23. Do you get short of breath walking with other people at an ordinary pace on the level? 1. ____ Yes 2. ____ No

If NO, grade is 2. If YES, proceed to next question.

24. Do you have to stop for breath when walking at your own pace on the level? 1. ____ Yes 2. ____ No

If NO, grade is 3. If YES, proceed to next question.

25. Are you short of breath on washing or dressing? 1. ____ Yes 2. ____ No

If NO, grade is 4, If YES, grade is 5.

26. Dyspnea Grd. _____

ON MONDAYS:

27. Are you ever troubled by shortness of breath, when hurrying on the level or walking up a slight hill? 1. ____ Yes 2. ____ No

If NO, grade is 1, If YES, proceed to next question.

28. Do you get short of breath walking with other people at an ordinary pace on the level? 1. ____ Yes 2. ____ No

If NO, grade is 2, If YES, proceed to next

question.

29. Do you have to stop for breath when walking at your own pace on the level? 1. ____ Yes 2. ____ No

If NO, grade is 3, If YES, proceed to next question.

30. Are you short of breath on washing or dressing? 1. ____ Yes 2. ____ No

If NO, grade is 4, If YES, grade is 5.

B. Grd. _____

OTHER ILLNESSES AND ALLERGY HISTORY

32. Do you have a heart condition for which you are under a doctor's care? 1. ____ Yes 2. ____ No

33. Have you ever had asthma? 1. ____ Yes 2. ____ No

If yes, did it begin:

(1) Before age 30 _____

(2) After age 30 _____

34. If yes before 30: did you have asthma before ever going to work in a textile mill? 1. ____ Yes 2. ____ No

35. Have you ever had hay fever or other allergies (other than above)? 1. ____ Yes 2. ____ No

TOBACCO SMOKING

36. Do you smoke? 1. ____ Yes 2. ____ No
Record Yes if regular smoker up to one month ago. (Cigarettes, cigar or pipe)

If NO to (33).

37. Have you ever smoked? (Cigarettes, cigars, pipe. Record NO if subject has never smoked as much as one cigarette a day, or 1 oz. of tobacco a month, for as long as one year.) 1. ____ Yes 2. ____ No

If YES to (33) or (34); what have you smoked for how many years? (Write in specific number of years in the appropriate square)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
Years	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	>40	
Cigarettes										(38)
Pipe										(39)
Cigars										(40)

41. If cigarettes, how many packs per day? Write in number of cigarettes _____

_____ Less than 1/2 pack

_____ 1/2 pack, but less than 1 pack

_____ 1 pack, but less than 1 1/2 packs

_____ 1-1/2 packs or more

42. Number of pack years: _____

43. If an ex-smoker (Cigarettes, cigar or pipe), how long since you stopped? (Write in number of years.) _____

_____ 0-1 year
_____ 1-4 years
_____ 5-9 years
_____ 10+ years

OCCUPATIONAL HISTORY

Have you ever worked in:

44. A foundry? 1. ____ Yes 2. ____ No
(As long as one year)

45. Stone or mineral mining, quarrying or processing? 1. ____ Yes 2. ____ No
(As long as one year)

46. Asbestos milling or processing? 1. ____ Yes 2. ____ No
(Ever)

47. Cotton or cotton blend mill? 1. ____ Yes 2. ____ No
(For controls only)

48. Other dusts, fumes or smoke? 1. ____ Yes 2. ____ No
If yes, specify.

Type of exposure _____

Length of exposure _____

APPENDIX B-III -- ABBREVIATED RESPIRATORY QUESTIONNAIRE

ABBREVIATED RESPIRATORY QUESTIONNAIRE

A. IDENTIFICATION DATA

PLANT _____

DAY MONTH YEAR

(figures) (last 2 digits)

NAME _____ DATE OF INTERVIEW _____

(Surname)

_____ DATE OF BIRTH _____

(First Names)

M F

ADDRESS _____ AGE ____ (8, 9) SEX _____(10)

RACE (11) (Check all that apply)

1. White ___
2. Black or African American ___
3. Asian ___
4. Hispanic or Latino ___
5. American Indian or Alaska Native ___
6. Native Hawaiian or Other Pacific Islander ___

INTERVIEWER: 1 2 3 4 5 6 7 8 (12)

WORK SHIFT: 1st _____ 2nd _____ 3rd _____ (13)

STANDING HEIGHT _____ (14, 15)

WEIGHT _____ (16, 18)

PRESENT WORK AREA

If working in more than one specified work area, X area where most of the work shift is spent. If "other," but spending 25% of the work shift in one of the specified work areas, classify in that work area. If carding department employee, check area within that department where most of the work shift is spent (if in doubt, check "throughout"). For work areas such as spinning and weaving where many work rooms may be involved, be sure to check to specific work room to which the employee is assigned - if he works in more than one work room within a department classify as 7 (all) for that department.

	Work-room Number	(19) Open	(20) Pick	Area	(21) Card #1	(22) #2	(23) Spin	(24) Wind	(25) Twist
AT RISK (cotton & Cotton blend)	1			Cards					
	2			Draw					
	3			Comb					
	4			Thru Out					
	5								
	6								
	7 (all)								
Control (synthetic & wool)	8								
Ex-Worker	9								

(cotton)									

Continued –

	Work-Room Number	(26) Spool	(27) Warp	(28) Slash	(29) Weave	(30) Other
AT RISK (cotton & cotton blend)	1					
	2					
	3					
	4					
	5					
	6					
	7 (all)					
Control (synthetic & wool)	8					
Ex-Worker (cotton)	9					

Use actual wording of each question. Put X in appropriate square after each question. When in doubt record `No'. When no square, circle appropriate answer.

B. COUGH

(on getting up)
Do you usually cough first thing in the morning? _____

Yes _____ No _____ (31)

(Count a cough with first smoke or on "first going out of doors." Exclude clearing throat or a single cough.)

Do you usually cough during the day or at night? Yes _____ No _____ (32)

(Ignore an occasional cough.)

If `Yes' to either question (31-32):

Do you cough like this on most days for as much as three months a year? Yes _____ No _____ (33)

Do you cough on any particular day of the week? Yes _____ No _____ (34)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
If 'Yes': Which day?	Mon	Tues	Wed	Thur	Fri	Sat	Sun	(35)

C. PHLEGM or alternative word to suit local custom.

(on getting up)

Do you usually bring up any phlegm from your chest first thing in the morning? (Count phlegm with the first smoke or on "first going out of doors." Exclude phlegm from the nose. Count swallowed phlegm.) Yes _____ No _____ (36)

Do you usually bring up any phlegm from your chest during the day or at night? (Accept twice or more.) Yes _____ No _____ (37)

If `Yes' to question (36) or (37):

Do you bring up any phlegm like this on most days for as much as three months each year? Yes _____ No _____ (38)

If `Yes' to question (33) or (38):

(cough)

How long have you had this phlegm?

(Write in number of years)

(1) ____ 2 years or less

(2) ____ More than 2 years-9 years

(3) ____ 10-19 years

(4) ____ 20+ years

* These words are for subjects who work at night

D. TIGHTNESS

Does your chest ever feel tight or your breathing become difficult?

Yes _____ No _____ (39)

Is your chest tight or your breathing difficult on any particular day of the week? (after a week or 10 days from the mill)

Yes _____ No _____ (40)

If `Yes': Which day? (3) (4) (5) (6) (7) (8)

Mon. ^ Tues. Wed. Thur. Fri. Sat. Sun. (41)

(1) / \ (2)

Sometimes Always

If `Yes' Monday At what time on Monday does your chest feel tight or your breathing difficult?

(1) ___ Before entering the mill (42)

(2) ___ After entering the mill

(Ask only if NO to Question (45))

In the past, has your chest ever been tight or your breathing difficult on any particular day of the week?

Yes _____ No _____ (43)

If `Yes': Which day?

(3) (4) (5) (6) (7) (8)

Mon. ^ Tues. Wed. Thur. Fri. Sat. Sun. (44)

(1) / \ (2)

Sometimes Always

E. TOBACCO SMOKING

* Have you changed your smoking habits since last interview?

If yes, specify what changes.

BILLING CODE 4510–26–C

Appendix C to § 1910.1043 [Reserved]

Appendix D to § 1910.1043—Pulmonary Function Standards for Cotton Dust Standard

The spirometric measurements of pulmonary function shall conform to the following minimum standards, and these standards are not intended to preclude additional testing or alternate methods which can be determined to be superior.

I. Apparatus

a. The instrument shall be accurate to within ±50 milliliters or within ±3 percent of reading, whichever is greater.

b. 1. Instruments purchased on or before May 14, 2020 should be capable of measuring vital capacity from 0 to 7 liters BTPS

2. Instruments purchased after May 14, 2020 should be capable of measuring vital capacity from 0 to 8 liters BTPS.

c. The instrument shall have a low inertia and offer low resistance to airflow such that the resistance to airflow at 12 liters per second must be less than 1.5 cm H_2O/(liter/sec).

d. The zero time point for the purpose of timing the FEV_1 shall be determined by extrapolating the steepest portion of the volume time curve back to the maximal inspiration volume (1, 2, 3, 4) or by an equivalent method.

e. 1. Instruments purchased on or before May 14, 2020 that incorporate measurements of airflow to determine volume shall conform to the same volume accuracy stated in paragraph (a) of this section I when presented with flow rates from at least 0 to 12 liters per second.

2. Instruments purchased after May 14, 2020 that incorporate measurements of airflow to determine volume shall conform to the same volume accuracy stated in paragraph (a) of this section I when presented with flow rates from at least 0 to 14 liters per second.

f. The instrument or user of the instrument must have a means of correcting volumes to body temperature saturated with water vapor (BTPS) under conditions of varying ambient spirometer temperatures and barometric pressures.

g. 1. Instruments purchased on or before May 14, 2020 shall provide a tracing or display of either flow versus volume or volume versus time during the entire forced expiration. A tracing or display is necessary to determine whether the patient has performed the test properly. The tracing must be stored and available for recall and must be of sufficient size that hand measurements may be made within the volume accuracy requirements of paragraph (a) of this section I. If a paper record is made it must have a paper speed of at least 2 cm/sec and a volume sensitivity of at least 10.0 mm of chart per liter of volume.

2. Instruments purchased after May 14, 2020 shall provide during testing a paper tracing or real-time display of flow versus volume and volume versus time for the entire forced expiration. Such a tracing or display is necessary to determine whether the worker has performed the test properly. Flow-volume and volume-time curves must be stored and available for recall. Real-time displays shall have a volume scale of at least 5 mm/L, a time scale of at least 10 mm/s, and a flow scale of at least 2.5 mm/L/s, when both flow-volume and volume-time displays are visible. If hand measurements will be made, paper tracings must be of sufficient size to allow those measurements to be made within the volume accuracy requirements of paragraph (a) of this section I. If a paper record is made it must have a paper speed of at least 2 cm/sec and a volume sensitivity of at least 10.0 mm of chart per liter of volume.

h. 1. Instruments purchased on or before May 14, 2020 shall be capable of accumulating volume for a minimum of 10 seconds and shall not stop accumulating volume before (i) the volume change for a 0.5-second interval is less than 25 milliliters, or (ii) the flow is less than 50 milliliters per second for a 0.5 second interval.

2. Instruments purchased after May 14, 2020 shall be capable of accumulating volume for a minimum of 15 seconds and shall not stop accumulating volume before the volume change for a 1-second interval is less than 25 milliliters.

i. The forced vital capacity (FVC) and forced expiratory volume in 1 second (FEV_1) measurements shall comply with the accuracy requirements stated in paragraph (a) of this section. That is, they should be accurately measured to within ±50 ml or within ±3 percent of reading, whichever is greater.

j. 1. Instruments purchased on or before May 14, 2020 must be capable of being calibrated in the field with respect to the FEV_1 and FVC. This calibration of the FEV_1 and FVC may be either directly or indirectly through volume and time base measurements. The volume calibration source should provide a volume displacement of at least 2 liters and should be accurate to within + or − 30 milliliters.

2. Instruments purchased after May 14, 2020 must be capable of having its calibration checked in the field and be recalibrated, if necessary, if the spirometer requires the technician to do so. The volume-calibration syringe shall provide a volume displacement of at least 3 liters and shall be accurate to within ± 0.5 percent of 3 liters (15 milliliters).

II. Technique for Measurement of Forced Vital Capacity Maneuver

a. Use of a nose clip is recommended but not required. The procedures shall be explained in simple terms to the worker who shall be instructed to loosen any tight clothing and stand in front of the apparatus. The worker may sit, but care should be taken on repeat testing that the same position be used and, if possible, the same spirometer. Particular attention shall be given to ensure that the chin is slightly elevated with the neck slightly extended. The worker shall be instructed to make a full inspiration from a normal breathing pattern and then blow into the apparatus, without interruption, as hard, fast, and completely as possible. At least three and no more than eight forced expirations shall be carried out. During the maneuvers, the worker shall be observed for compliance with instruction. The expirations shall be checked visually for technical acceptability and repeatability from flow-volume or volume-time tracings or displays. The following efforts shall be judged technically unacceptable when the worker:

1. Has not reached full inspiration preceding the forced expiration,

2. Has not used maximal effort during the entire forced expiration,

3. Has not tried to exhale continuously for at least 6 seconds and the volume-time curve shows no change in volume (<0.025 L) for at least one second,

4. Has coughed in the first second or closed the glottis,

5. Has an obstructed mouthpiece or a leak around the mouthpiece (obstruction due to tongue being placed in front of mouthpiece, false teeth falling in front of mouthpiece, etc.),

6. Has an unsatisfactory start of expiration, one characterized by excessive hesitation (or false starts), and, therefore, not allowing back extrapolation of time 0 (extrapolated volume on the volume-time tracing must be less than 150 milliliters or 5 percent of the FVC, whichever is greater.), and

7. Has an excessive variability between the acceptable curves. The difference between the two largest FVCs from the satisfactory tracings shall not exceed 150 milliliters and the difference between the two largest FEV_1s of the satisfactory tracings shall not exceed 150 milliliters.

b. Calibration checks of the volume accuracy of the instrument for recording FVC and FEV_1 shall be performed daily or more frequently if specified by the spirometer manufacturer, using a 3-liter syringe. Calibration checks to ensure that the spirometer is recording 3 liters of injected air to within ±3.5 percent, or 2.90 to 3.10 liters, shall be conducted. Calibration checks of flow-type spirometers shall include injection of 3 liters air over a range of speeds, with injection times of 0.5 second, 3 seconds, and 6 or more seconds. Checks of volume-type spirometers shall include a single calibration check and a check to verify that the spirometer is not leaking more than 30 milliliters/minute air.

III. Interpretation of Spirogram

a. The first step in evaluating a spirogram should be to determine whether or not the worker has performed the test properly or as described in section II of this appendix. From the three satisfactory tracings, the forced vital capacity (FVC) and forced expiratory volume in 1 second (FEV_1) shall be measured and recorded. The largest observed FVC and largest observed FEV_1 shall be used in the analysis regardless of the curve(s) on which they occur.

b. [Reserved]

IV. Qualifications of Personnel Administering the Test

Technicians who perform pulmonary function testing should have the basic knowledge required to produce meaningful results. Training consisting of approximately 16 hours of formal instruction should cover the following areas.

a. Basic physiology of the forced vital-capacity maneuver and the determinants of airflow limitation, with emphasis on the relation to repeatability of results.

b. Instrumentation requirements, including calibration check procedures, sources of error, and their correction.

c. Performance of the testing including worker coaching, recognition of improperly performed maneuvers and corrective actions.

d. Data quality with emphasis on repeatability.

e. Actual use of the equipment under supervised conditions.

f. Measurement of tracings and calculations of results.

■ 11. Revise paragraphs (n)(2)(iii) and (n)(3)(i) and (ii) of § 1910.1045 to read as follows:

§ 1910.1045 Acrylonitrile.

* * * * *

(n) * * *

(2) * * *

(iii) A 14- by 17-inch or other reasonably-sized standard film or digital posterior-anterior chest X-ray; and

* * * * *

(3) * * *

(i) The employer shall provide the examinations specified in paragraphs (n)(2)(i), (ii), and (iv) of this section at least annually for all employees specified in paragraph (n)(1) of this section.

(ii) If an employee has not had the examination specified in paragraphs (n)(2)(i), (ii), and (iv) of this section within 6 months preceding termination of employment, the employer shall make such examination available to the employee prior to such termination.

* * * * *

■ 12. Revise appendix D of § 1910.1048 to read as follows:

§ 1910.1048 Formaldehyde.

* * * * *

BILLING CODE 4510–26–P

APPENDIX D TO § 1910.1048—NONMANDATORY MEDICAL DISEASE QUESTIONNAIRE

A. Identification

Plant Name: _____

Date: _____

Employee Name: _____

Job Title: _____

Birthdate: _____

Age: _____

Sex: _____

Height: _____

Weight: _____

B. Medical History

1. Have you ever been in the hospital as a patient?

   Yes__ No__

   If yes, what kind of problem were you having? _____

   _____

2. Have you ever had any kind of operation?

   Yes__ No__

   If yes, what kind? _____

   _____

3. Do you take any kind of medicine regularly?

   Yes__ No__

   If yes, what kind? _____

   _____

4. Are you allergic to any drugs, foods, or chemicals?

   Yes__ No__

   If yes, what kind of allergy is it? _____

   _____

   What causes the allergy? _____

   _____

5. Have you ever been told that you have asthma, hayfever, or sinusitis?

   Yes__ No__

6. Have you ever been told that you have emphysema, bronchitis, or any other respiratory problems?

   Yes__ No__

7. Have you ever been told you had hepatitis?

   Yes__ No__

8. Have you ever been told that you had cirrhosis?

   Yes__ No__

9. Have you ever been told that you had cancer?

   Yes__ No__

10. Have you ever had arthritis or joint pain?

    Yes__ No__

11. Have you ever been told that you had high blood pressure?

    Yes__ No__

12. Have you ever had a heart attack or heart trouble?

    Yes__ No__

B-1. Medical History Update

1. Have you been in the hospital as a patient any time within the past year?

   Yes__ No__

   If so, for what condition? _____

   _____

2. Have you been under the care of a physician during the past year?

   Yes__ No__

   If so, for what condition?_____

   _____

3. Is there any change in your breathing since last year?

   Yes__ No__

   Better? _____

   Worse? _____

   No change?_____

   If change, do you know why?_____

   _____

4. Is your general health different this year from last year?

   Yes__ No__

   If different, in what way?_____

   _____

5. Have you in the past year or are you now taking any medication on a regular basis?

   Yes__ No__

   Name Rx_____

   Condition being treated _____

C. Occupational History

1. How long have you worked for your present employer?

   _____

2. What jobs have you held with this employer? Include job title and length of time in each job _____

   _____

   _____

   _____

3. In each of these jobs, how many hours a day were you exposed to chemicals?

   _____

4. What chemicals have you worked with most of the time?

   _____

5. Have you ever noticed any type of skin rash you feel was related to your work?

   Yes__ No__

6. Have you ever noticed that any kind of chemical makes you cough?

   Yes__ No__

   Wheeze?

   Yes__ No__

   Become short of breath or cause your chest to become tight?

   Yes__ No__

7. Are you exposed to any dust or chemicals at home?

   Yes__ No__

   If yes, explain: _____

   _____

8. In other jobs, have you ever had exposure to:

   Wood dust?

   Yes__ No__

   Nickel or chromium?

   Yes__ No__

   Silica (foundry, sand blasting)?

   Yes__ No__

   Arsenic or asbestos?

   Yes__ No__

   Organic solvents?

   Yes__ No__

   Urethane foams?

   Yes__ No__

C-1. Occupational History Update

1. Are you working on the same job this year as you were last year?

   Yes__ No__

   If not, how has your job changed? _____

   _____

2. What chemicals are you exposed to on your job?

_____

3. How many hours a day are you exposed to chemicals?

_____

4. Have you noticed any skin rash within the past year you feel was related to your work?

Yes__ No__

If so, explain circumstances: _____

_____

5. Have you noticed that any chemical makes you cough, be short of breath, or wheeze?

Yes__ No__

If so, can you identify it? _____

_____

D. Miscellaneous

1. Do you smoke?

Yes__ No__

If so, how much and for how long? _____

_____

Pipe_____

Cigars_____

Cigarettes_____

2. Do you drink alcohol in any form?

Yes__ No__

If so, how much, how long, and how often? _____

_____

3. Do you wear glasses or contact lenses?

Yes__ No__

4. Do you get any physical exercise other than that required to do your job?

Yes__ No__

If so, explain: _____

_____

5. Do you have any hobbies or "side jobs" that require you to use chemicals, such as furniture stripping, sand blasting, insulation or manufacture of urethane foam, furniture, etc.?

   Yes__ No__

   If so, please describe, giving type of business or hobby, chemicals used and length of exposures.

E. Symptoms Questionnaire

1. Do you ever have any shortness of breath?

   Yes__ No__

   If yes, do you have to rest after climbing several flights of stairs?

   Yes__ No__

   If yes, if you walk on the level with people your own age, do you walk slower than they do?

   Yes__ No__

   If yes, if you walk slower than a normal pace, do you have to limit the distance that you walk?

   Yes__ No__

   If yes, do you have to stop and rest while bathing or dressing?

   Yes__ No__

2. Do you cough as much as three months out of the year?

   Yes__ No__

   If yes, have you had this cough for more than two years?

   Yes__ No__

   If yes, do you ever cough anything up from chest?

   Yes__ No__

3. Do you ever have a feeling of smothering, unable to take a deep breath, or tightness in your chest?

   Yes__ No__

   If yes, do you notice that this on any particular day of the week?

   Yes__ No__

   If yes, what day or the week?

   Yes__ No__

   If yes, do you notice that this occurs at any particular place?

   Yes__ No__

   If yes, do you notice that this is worse after you have returned to work after being off for several days?

   Yes__ No__

4. Have you ever noticed any wheezing in your chest?

   Yes__ No__

   If yes, is this only with colds or other infections?

   Yes__ No__

   Is this caused by exposure to any kind of dust or other material?

   Yes__ No__

   If yes, what kind? _____

5. Have you noticed any burning, tearing, or redness of your eyes when you are at work?

   Yes__ No__

   If so, explain circumstances: _____

   _____

6. Have you noticed any sore or burning throat or itchy or burning nose when you are at work?

   Yes__ No__

   If so, explain circumstances: _____

   _____

7. Have you noticed any stuffiness or dryness of your nose?

   Yes__ No__

8. Do you ever have swelling of the eyelids or face?

   Yes__ No__

9. Have you ever been jaundiced?

   Yes__ No__

   If yes, was this accompanied by any pain?

   Yes__ No__

10. Have you ever had a tendency to bruise easily or bleed excessively?

    Yes__ No__

11. Do you have frequent headaches that are not relieved by aspirin or Tylenol?

    Yes__ No__

    If yes, do they occur at any particular time of the day or week?

    Yes__ No__

    If yes, when do they occur? _____

    _____

12. Do you have frequent episodes of nervousness or irritability?

    Yes__ No__

13. Do you tend to have trouble concentrating or remembering?

    Yes__ No__

14. Do you ever feel dizzy, light-headed, excessively drowsy or like you have been drugged?

    Yes__ No__

15. Does your vision ever become blurred?

    Yes__ No__

16. Do you have numbness or tingling of the hands or feet or other parts of your body?

    Yes__ No__

17. Have you ever had chronic weakness or fatigue?

    Yes__ No__

18. Have you ever had any swelling of your feet or ankles to the point where you could not wear your shoes?

    Yes__ No__

19. Are you bothered by heartburn or indigestion?

Yes__ No__

20. Do you ever have itching, dryness, or peeling and scaling of the hands?

Yes__ No__

21. Do you ever have a burning sensation in the hands, or reddening of the skin?

Yes__ No__

22. Do you ever have cracking or bleeding of the skin on your hands?

Yes__ No__

23. Are you under a physician's care?

Yes__ No__

If yes, for what are you being treated? _____

_____

24. Do you have any physical complaints today?

Yes__ No__

If yes, explain? _____

_____

25. Do you have other health conditions not covered by these questions?

Yes__ No__

If yes, explain: _____

_____

■ 13. Revise appendix F of § 1910.1051 to read as follows:

§ 1910.1051 1,3-Butadiene.

* * * * *

APPENDIX F TO § 1910.1051—MEDICAL QUESTIONNAIRES (NON-MANDATORY)

1,3-Butadiene (BD) Initial Health Questionnaire

DIRECTIONS:

You have been asked to answer the questions on this form because you work with BD (butadiene). These questions are about your work, medical history, and health concerns. Please do your best to answer all of the questions. If you need help, please tell the doctor or health care professional who reviews this form.

This form is a confidential medical record. Only information directly related to your health and safety on the job may be given to your employer. Personal health information will not be given to anyone without your consent.

Date: _____

Name: _____ _____ ____

Last First MI

Job Title: _____

Company's Name: _____

Supervisor's Name: _____ Supervisor's Phone No.: ( ) ____-_____

Work History

1. Please list all jobs you have had in the past, starting with the job you have now and m oving back in time to your first job. (For more space, write on the back of this page.)

Main Job Duty	Years	Company Name City, State	Chemicals
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			

2. Please describe what you do during a typical work day. Be sure to tell about you work with BD

_____

_____

3. Please check any of these chemicals that you work with now or have worked with in the past:

benzene ____

glues ____

toluene ____

inks, dyes ____

other solvents, grease cutters ____

insecticides (like DDT, lindane, etc.) ____

paints, varnishes, thinners, strippers ____

dusts ____

carbon tetrachloride ("carbon tet") ____

arsine ____

carbon disulfide ____

lead ____

cement ____

petroleum products ____

nitrites ____

4. Please check the protective clothing or equipment you use at the job you have now:

gloves ____

coveralls ____

respirator ____

dust mask ____

safety glasses, goggles ____

Please circle your answer of yes or no.

5. Does your protective clothing or equipment fit you properly?

yes no

6. Have you ever made changes in your protective clothing or equipment to make it fit better?

yes no

7. Have you been exposed to BD when you were not wearing protective clothing or equipment?

yes no

8. Where do you eat, drink and/or smoke when you are at work?

(Please check all that apply.)

Cafeteria/restaurant/snack bar ____

Break room/employee lounge ____

Smoking lounge ____

At my work station ____

Please circle your answer.

9. Have you been exposed to radiation (like x-rays or nuclear material) at the job you have now or at past jobs?

yes no

10. Do you have any hobbies that expose you to dusts or chemicals (including paints, glues, etc.)?

yes no

11. Do you have any second or side jobs?

yes no

If yes, what are your duties there? _____

_____

_____

_____

12. Were you in the military?

yes no

If yes, what did you do in the military? _____

_____

_____

_____

Family Health History

1. In the FAMILY MEMBER column, across from the disease name, write which family member, if any, had the disease.

Disease	Family Member
Cancer	
Lymphoma	
Sickle Cell Disease or Trait	
Immune Disease	
Leukemia	
Anemia	

2. Please fill in the following information about family health:

RELATIVE	ALIVE?	AGE AT DEATH?	CAUSE OF DEATH?
Father			
Mother			
Brother/Sister			
Brother/Sister			
Brother/Sister			

PERSONAL HEALTH HISTORY

Birth Date ____/____/_____ Age _____ Sex ___ Height _____ Weight _____

Please circle your answer.

1. Do you smoke any tobacco products?

   yes no

2. Have you ever had any kind of surgery or operation?

   yes no

   If yes, what type of surgery: _____

   _____

   _____

3. Have you ever been in the hospital for any other reasons?

   yes no

   If yes, please describe the reason: _____

   _____

   _____

4. Do you have any on-going or current medical problems or conditions?

   yes no

   If yes, please describe: _____

   _____

5. Do you now have or have you ever had any of the following? Please check all that apply to you.

unexplained fever _____

anemia ("low blood") _____

HIV/AIDS _____

weakness _____

sickle cell _____

miscarriage _____

skin rash _____

bloody stools _____

leukemia/lymphoma _____

neck mass/swelling _____

wheezing _____

yellowing of skin _____

bruising easily _____

lupus _____

weight loss _____

kidney problems _____

enlarged lymph nodes _____

liver disease _____

cancer _____

infertility _____

drinking problems _____

thyroid problems _____

night sweats _____

chest pain _____

still birth _____

eye redness ____

lumps you can feel ____

child with birth defect ____

autoimmune disease ____

overly tired ____

lung problems ____

rheumatoid arthritis ____

mononucleosis("mono") ____

nagging cough ____

Please circle your answer.

6. Do you have any symptoms or health problems that you think may be related to your work with BD?

yes no

If yes, please describe: _____

_____

7. Have any of your co-workers had similar symptoms or problems?

yes no don't know

If yes, please describe: _____

_____

8. Do you notice any irritation of your eyes, nose, throat, lungs or skin when working with BD?

yes no

9. Do you notice any blurred vision, coughing, drowsiness, nausea, or headache when working with BD?

yes no

10. Do you take any medications (including birth control or over-the-counter)?

yes no

If yes, please list: _____

_____

11. Are you allergic to any medication, food, or chemicals?

yes no

If yes, please list: _____

_____

12. Do you have any health conditions not covered by this questionnaire that you think are affected by your work with BD?

yes no

If yes, please explain: _____

_____

13. Did you understand all the questions?

yes no

_____

Signature

1,3-Butadiene (BD) Update Health Questionnaire

DIRECTIONS:

You have been asked to answer the questions on this form because you work with BD (butadiene). These questions ask about changes in your work, medical history, and health concerns since the last time you were evaluated. Please do your best to answer all of the questions. If you need help, please tell the doctor or health care professional who reviews this form.

This form is a confidential medical record. Only information directly related to your health and safety on the job may be given to your employer. Personal health information will not be given to anyone without your consent.

Date: _____

Name:_____

Last First MI

Job Title: _____

Company's Name: _____

Supervisor's Name: _____ Supervisor's Phone No.: ( ) _____-_____

Present Work History

1. Please describe any NEW duties that you have at your job:_____
_____
_____
_____
_____
_____

2. Please list any additional job titles you have:

_____ _____

_____ _____

_____ _____

Please circle your answer.

3. Are you exposed to any other chemicals in your work since the last time you were evaluated for exposure to BD?

yes no

If yes, please list what they are: _____
_____

4. Does your personal protective equipment and clothing fit you properly?

yes no

5. Have you made changes in this equipment or clothing to make it fit better?

yes no

6. Have you been exposed to BD when you were not wearing protective equipment or clothing?

yes no

7. Are you exposed to any NEW chemicals at home or while working on hobbies?

yes no

If yes, please list what they are: _____

_____

8. Since your last BD health evaluation, have you started working any new second or side jobs?

yes no

If yes, what are your duties there? _____

_____

_____

Personal Health History

1. What is your current weight? _____ pounds

2. Have you been diagnosed with any new medical conditions or illness since your last evaluation?

yes no

If yes, please tell what they are: _____

_____

3. Since your last evaluation, have you been in the hospital for any illnesses, injuries, or surgery?

yes no

If yes, please describe: _____

_____

4. Do you have any of the following? Please place a check for all that apply to you.

unexplained fever	____	liver disease	____
anemia ("low blood")	____	cancer	____
HIV/AIDS	____	infertility	____
weakness	____	drinking problems	____
sickle cell	____	thyroid problems	____
miscarriage	____	night sweats	____
skin rash	____	still birth	____
bloody rash	____	eye redness	____
leukemia/lymphoma	____	lumps you can feel	____
neck mass/swelling	____	child with birth defect	____
wheezing	____	autoimmune disease	____
chest pain	____	overly tired	____
bruising easily	____	lung problems	____
lupus	____	rheumatoid arthritis	____
weight loss	____	mononucleosis "mono"	____
kidney problems	____	nagging cough	____
enlarged lymph nodes	____	yellowing of skin	____

Please circle your answer.

5. Do you have any symptoms or health problems that you think may be related to your work with BD?

yes no

If yes, please describe: _____

_____

6. Have any of your co-workers had similar symptoms or problems?

yes no don't know

If yes, please describe: _____

_____

7. Do you notice any irritation of your eyes, nose, throat, lungs, or skin when working with BD?

yes no

8. Do you notice any blurred vision, coughing, drowsiness, nausea, or headache when working with BD?

yes no

9. Have you been taking any NEW medications (including birth control or over-the-counter)?

yes no

If yes, please list:

_____ _____ _____

_____ _____ _____

10. Have you developed any NEW allergies to medications, foods, or chemicals?

yes no

If yes, please list:

_____ _____ _____

_____ _____ _____

11. Do you have any health conditions not covered by this questionnaire that you think are affected by your work with BD?

yes no

If yes, please explain: _____

_____

12. Did you understand all the questions?

yes no

Signature

BILLING CODE 4510–26–C

■ 14. Revise appendix B, section IV, of § 1910.1052 to read as follows:

§ 1910.1052 Methylene chloride.

* * * * *

Appendix B to § 1910.1052—Medical Surveillance for Methylene Chloride

* * * * *

IV. Surveillance and Preventive Considerations

As discussed in sections II and III of this appendix, MC is classified as a suspect or potential human carcinogen. It is a central nervous system (CNS) depressant and a skin, eye and respiratory tract irritant. At extremely high concentrations, MC has caused liver damage in animals. MC principally affects the CNS, where it acts as a narcotic. The observation of the symptoms characteristic of CNS depression, along with a physical examination, provides the best detection of early neurological disorders. Since exposure to MC also increases the carboxyhemoglobin level in the blood, ambient carbon monoxide levels would have an additive effect on that carboxyhemoglobin level. Based on such information, a periodic post-shift carboxyhemoglobin test as an index of the presence of carbon monoxide in the blood is recommended, but not required, for medical surveillance.

Based on the animal evidence and three epidemiologic studies previously mentioned, OSHA concludes that MC is a suspect human carcinogen. The medical surveillance program is designed to observe exposed workers on a regular basis. While the medical surveillance program cannot detect MC-induced cancer at a preneoplastic stage, OSHA anticipates that, as in the past, early detection and treatments of cancers leading to enhanced survival rates will continue to evolve.

A. Medical and Occupational History

The medical and occupational work history plays an important role in the initial evaluation of workers exposed to MC. It is therefore extremely important for the examining physician or other licensed health care professional to evaluate the MC-exposed worker carefully and completely and to focus the examination on MC's potentially associated health hazards. The medical evaluation must include an annual detailed work and medical history with special emphasis on cardiac history and neurological symptoms.

An important goal of the medical history is to elicit information from the worker regarding potential signs or symptoms associated with increased levels of carboxyhemoglobin due to the presence of carbon monoxide in the blood. Physicians or other licensed health care professionals should ensure that the smoking history of all MC exposed employees is known. Exposure to MC may cause a significant increase in carboxyhemoglobin level in all exposed persons. However, smokers as well as workers with anemia or heart disease and those concurrently exposed to carbon monoxide are at especially high risk of toxic effects because of an already reduced oxygen carrying capacity of the blood.

A comprehensive or interim medical and work history should also include occurrence of headache, dizziness, fatigue, chest pain, shortness of breath, pain in the limbs, and irritation of the skin and eyes.

In addition, it is important for the physician or other licensed health care professional to become familiar with the operating conditions in which exposure to MC is likely to occur. The physician or other licensed health care professional also must become familiar with the signs and symptoms that may indicate that a worker is receiving otherwise unrecognized and exceptionally high exposure levels of MC.

An example of a medical and work history that would satisfy the requirement for a comprehensive or interim work history is represented by the following:

The following is a list of recommended questions and issues for the self-administered questionnaire for methylene chloride exposure.

BILLING CODE 4510–26–P

QUESTIONNAIRE FOR METHYLENE CHLORIDE EXPOSURE

I. Demographic Information

1. Name
2. Date
3. Date of Birth
4. Age
5. Present occupation
6. Sex
7. Race (Check all that apply)

a. White ___
b. Black or African American___
c. Asian ___
d. Hispanic or Latino ___
e. American Indian or Alaska Native ___
f. Native Hawaiian or Other Pacific Islander ___

II. Occupational History

1. Have you ever worked with methylene chloride, dichloromethane, methylene dichloride, or CH_2Cl_2 (all are different names for the same chemical)? Please list which on the occupational history form if you have not already.

2. If you have worked in any of the following industries and have not listed them on the occupational history form, please do so.

Furniture stripping
Polyurethane foam manufacturing
Chemical manufacturing or formulation
Pharmaceutical manufacturing
Any industry in which you used solvents to clean and degrease equipment or parts
Construction, especially painting and refinishing
Aerosol manufacturing
Any industry in which you used aerosol adhesives

3. If you have not listed hobbies or household projects on the occupational history form, especially furniture refinishing, spray painting, or paint stripping, please do so.

III. Medical History

A. General

1. Do you consider yourself to be in good health? If no, state reason(s).

2. Do you or have you ever had:

   a. Persistent thirst
   b. Frequent urination (three times or more at night)
   c. Dermatitis or irritated skin
   d. Non-healing wounds

3. What prescription or non-prescription medications do you take, and for what reasons?

4. Are you allergic to any medications, and what type of reaction do you have?

B. Respiratory

1. Do you have or have you ever had any chest illnesses or diseases? Explain.

2. Do you have or have you ever had any of the following:

   a. Asthma
   b. Wheezing
   c. Shortness of breath

3. Have you ever had an abnormal chest X-ray? If so, when, where, and what were the findings?

4. Have you ever had difficulty using a respirator or breathing apparatus? Explain.

5. Do any chest or lung diseases run in your family? Explain.

6. Have you ever smoked cigarettes, cigars, or a pipe? Age started:

7. Do you now smoke?

8. If you have stopped smoking completely, how old were you when you stopped?

9. On the average of the entire time you smoked, how many packs of cigarettes, cigars, or bowls of tobacco did you smoke per day?

C. Cardiovascular

1. Have you ever been diagnosed with any of the following: Which of the following apply to you now or did apply to you at some time in the past, even if the problem is controlled by medication? Please explain any yes answers (i.e., when problem was diagnosed, length of time on medication).

    a. High cholesterol or triglyceride level

    b. Hypertension (high blood pressure)

    c. Diabetes

    d. Family history of heart attack, stroke, or blocked arteries

2. Have you ever had chest pain? If so, answer the next five questions.

    a. What was the quality of the pain (i.e., crushing, stabbing, squeezing)?

    b. Did the pain go anywhere (i.e., into jaw, left arm)?

    c. What brought the pain out?

    d. How long did it last?

    e. What made the pain go away?

3. Have you ever had heart disease, a heart attack, stroke, aneurysm, or blocked arteries anywhere in your body? Explain (when, treatment).

4. Have you ever had bypass surgery for blocked arteries in your heart or anywhere else? Explain.

5. Have you ever had any other procedures done to open up a blocked artery (balloon angioplasty, carotid endarterectomy, clot-dissolving drug)?

6. Do you have or have you ever had (explain each):

    a. Heart murmur
    b. Irregular heartbeat
    c. Shortness of breath while lying flat
    d. Congestive heart failure
    e. Ankle swelling
    f. Recurrent pain anywhere below the waist while walking

7. Have you ever had an electrocardiogram (EKG)? When?

8. Have you ever had an abnormal EKG? If so, when, where, and what were the findings?

9. Do any heart diseases, high blood pressure, diabetes, high cholesterol, or high triglycerides run in your family? Explain.

D. Hepatobiliary and Pancreas

1. Do you now or have you ever drunk alcoholic beverages?
   Age started: _____ Age stopped: _____.

2. Average numbers per week:

    a. Beers: _____, ounces in usual container:
    b. Glasses of wine: _____, ounces per glass:
    c. Drinks: _____, ounces in usual container:

3. Do you have or have you ever had (explain each):

    a. Hepatitis (infectious, autoimmune, drug-induced, or chemical)
    b. Jaundice
    c. Elevated liver enzymes or elevated bilirubin
    d. Liver disease or cancer

E. Central Nervous System

1. Do you or have you ever had (explain each):

   a. Headache
   b. Dizziness
   c. Fainting
   d. Loss of consciousness
   e. Garbled speech
   f. Lack of balance
   g. Mental/psychiatric illness
   h. Forgetfulness

F. Hematologic

1. Do you have, or have you ever had (explain each):

   a. Anemia
   b. Sickle cell disease or trait
   c. Glucose-6-phosphate dehydrogenase deficiency
   d. Bleeding tendency disorder

2. If not already mentioned previously, have you ever had a reaction to sulfa drugs or to drugs used to prevent or treat malaria? What was the drug? Describe the reaction.

B. Physical Examination

The complete physical examination, when coupled with the medical and occupational history, assists the physician or other licensed health care professional in detecting pre-existing conditions that might place the employee at increased risk, and establishes a baseline for future health monitoring. These examinations should include:

1. Clinical impressions of the nervous system, cardiovascular function and pulmonary function, with additional tests conducted where indicated or determined by the examining physician or other licensed health care professional to be necessary.

2. An evaluation of the advisability of the worker using a respirator, because the use of certain respirators places an additional burden on the cardiopulmonary system. It is necessary for the attending physician or other licensed health care professional to evaluate the cardiopulmonary function of these workers, in order to inform the employer in a written medical opinion of the worker's ability or fitness to work in an area requiring the use of certain types of respiratory protective equipment. The presence of facial hair or scars that might interfere with the worker's ability to wear certain types of respirators should also be noted during the examination and in the written medical opinion.

Because of the importance of lung function to workers required to wear certain types of respirators to protect themselves from MC exposure, these workers must receive an assessment of pulmonary function before they begin to wear a negative pressure respirator and at least annually thereafter. The recommended pulmonary function tests include measurement of the employee's forced vital capacity (FVC), forced expiratory volume at one second (FEV_1), as well as calculation of the ratios of FEV_1 to FVC, and the ratios of measured FVC and measured FEV_1 to expected respective values corrected for variation due to age, sex, race, and height. Pulmonary function evaluation must be conducted by a physician or other licensed health care professional experienced in pulmonary function tests.

The following is a summary of the elements of a physical exam which would fulfill the requirements under the MC standard:

PHYSICAL EXAM

I. Skin and appendages

1. Irritated or broken skin
2. Jaundice
3. Clubbing cyanosis, edema
4. Capillary refill time
5. Pallor

II. Head

1. Facial deformities
2. Scars
3. Hair growth

III. Eyes

1. Scleral icterus
2. Corneal arcus
3. Pupillary size and response
4. Fundoscopic exam

IV. Chest

1. Standard exam

V. Heart

1. Standard exam
2. Jugular vein distension
3. Peripheral pulses

VI. Abdomen

1. Liver span

VII. Nervous System

1. Complete standard neurologic exam

VIII. Laboratory

1. Hemoglobin and hematocrit
2. Alanine aminotransferase (ALT, SGPT)
3. Post-shift carboxyhemoglobin

IX. Studies

1. Pulmonary function testing
2. Electrocardiogram

An evaluation of the oxygen carrying capacity of the blood of employees (for example by measured red blood cell volume) is considered useful, especially for workers acutely exposed to MC.

It is also recommended, but not required, that end of shift carboxyhemoglobin levels be determined periodically, and any level above 3% for non-smokers and above 10% for smokers should prompt an investigation of the worker and his workplace. This test is recommended because MC is metabolized to CO, which combines strongly with hemoglobin, resulting in a reduced capacity of the blood to transport oxygen in the body. This is of particular concern for cigarette smokers because they already have a diminished hemoglobin capacity due to the presence of CO in cigarette smoke.

C. Additional Examinations and Referrals

1. Examination by a Specialist

When a worker examination reveals unexplained symptoms or signs (i.e. in the physical examination or in the laboratory tests), follow-up medical examinations are necessary to assure that MC exposure is not adversely affecting the worker's health. When the examining physician or other licensed health care professional finds it necessary, additional tests should be included to determine the nature of the medical

problem and the underlying cause. Where relevant, the worker should be sent to a specialist for further testing and treatment as deemed necessary.

The final rule requires additional investigations to be covered and it also permits physicians or other licensed health care professionals to add appropriate or necessary tests to improve the diagnosis of disease should such tests become available in the future.

2. Emergencies

The examination of workers exposed to MC in an emergency should be directed at the organ systems most likely to be affected. If the worker has received a severe acute exposure, hospitalization may be required to assure proper medical intervention. It is not possible to precisely define "severe," but the physician or other licensed health care professional's judgment should not merely rest on hospitalization. If the worker has suffered significant conjunctival, oral, or nasal irritation, respiratory distress, or discomfort, the physician or other licensed health care professional should instigate appropriate follow-up procedures. These include attention to the eyes, lungs and the neurological system. The frequency of follow-up examinations should be determined by the attending physician or other licensed health care professional. This testing permits the early identification essential to proper medical management of such workers.

D. Employer Obligations

The employer is required to provide the responsible physician or other licensed health care professional and any specialists involved in a diagnosis with the following information: a copy of the MC standard including relevant appendices, a description of the affected employee's duties as they relate to his or her exposure to MC; an estimate of the employee's exposure including duration (e.g., 15hr/wk, three 8-hour shifts/wk, full

time); a description of any personal protective equipment used by the employee, including respirators; and the results of any previous medical determinations for the affected employee related to MC exposure to the extent that this information is within the employer's control.

E. Physicians' or Other Licensed Health Care Professionals' Obligations

The standard in this section requires the employer to ensure that the physician or other licensed health care professional provides a written statement to the employee and the employer. This statement should contain the physician's or licensed health care professional's opinion as to whether the employee has any medical condition placing him or her at increased risk of impaired health from exposure to MC or use of respirators, as appropriate. The physician or other licensed health care professional should also state his or her opinion regarding any restrictions that should be placed on the employee's exposure to MC or upon the use of protective clothing or equipment such as respirators. If the employee wears a respirator as a result of his or her exposure to MC, the physician or other licensed health care professional's opinion should also contain a statement regarding the suitability of the employee to wear the type of respirator assigned. Furthermore, the employee should be informed by the physician or other licensed health care professional about the cancer risk of MC and about risk factors for heart disease, and the potential for exacerbation of underlying heart disease by exposure to MC through its metabolism to carbon monoxide. Finally, the physician or other licensed health care professional should inform the employer that the employee has been told the results of the medical examination and of any medical conditions which require further explanation

or treatment. This written opinion must not contain any information on specific findings or diagnosis unrelated to employee's occupational exposures.

The purpose in requiring the examining physician or other licensed health care professional to supply the employer with a written opinion is to provide the employer with a medical basis to assist the employer in placing employees initially, in assuring that their health is not being impaired by exposure to MC, and to assess the employee's ability to use any required protective equipment.

BILLING CODE 4510–26–C

* * * * *

PART 1915—OCCUPATIONAL SAFETY AND HEALTH STANDARDS FOR SHIPYARD EMPLOYMENT

■ 15. The authority citation for part 1915 continues to read as follows:

Authority: 33 U.S.C. 941; 29 U.S.C. 653, 655, 657; Secretary of Labor's Order No. 12–71 (36 FR 8754); 8–76 (41 FR 25059), 9–83 (48 FR 35736), 1–90 (55 FR 9033), 6–96 (62 FR 111), 3–2000 (65 FR 50017), 5–2002 (67 FR 65008), 5–2007 (72 FR 31160), 4–2010 (75 FR 55355), or 1–2012 (77 FR 3912); 29 CFR part 1911; and 5 U.S.C. 553, as applicable.

Sections 1915.120 and 1915.152 also issued under 29 CFR part 1911.

Subpart A—General Provisions

■ 16. Amend § 1915.5 by:
■ a. Revising paragraphs (b) and (c).
■ b. Redesignating paragraph (d) as follows:

Old paragraph	New paragraph
(d)(1)	(d).
(d)(1)(i) through (xiii)	(d)(1) through (13).
(d)(1)(vi)(A) through (C)	(d)(6)(i) through (iii).
(d)(1)(vii)(A) through (C)	(d)(7)(i) through (iii).
(d)(1)(viii)(A) through (C)	(d)(8)(i) through (iii).
(d)(2)	(e).
(d)(2)(i)	(e)(1).
(d)(3)	(f).
(d)(3)(i)	(f)(1).
(d)(4)	(i).
(d)(4)(i) through (xviii)	(i)(1) though (18).
(d)(5)	(g).
(d)(5)(i) and (ii)	(g)(1) and (2).

■ c. In newly redesignated paragraph (d) introductory text, removing ''below in this paragraph'' and adding in its place ''in this paragraph (d).''
■ d. Adding reserved paragraphs (e)(2) and (f)(2).
■ e. In newly redesignated paragraph (g) introductory text, removing ''below in this paragraph'' and adding in its place ''in this paragraph (g).''
■ f. Adding paragraph (h).

The revisions and additions read as follows:

§ 1915.5 Incorporation by reference.

* * * * *

(b)(1) The standards listed in this section are incorporated by reference into this part with the approval of the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in this section, OSHA must publish a document in the **Federal Register** and the material must be available to the public.

(2) Any changes in the standards incorporated by reference in this part and an official historic file of such changes are available for inspection in the Docket Office at the national office of the Occupational Safety and Health Administration, U.S. Department of Labor, Washington, DC 20210; telephone: 202–693–2350 (TTY number: 877–889–5627).

(c) Copies of standards listed in this section and issued by private standards organizations are available for purchase from the issuing organizations at the addresses or through the other contact information listed below for these private standards organizations. In addition, the standards are available for inspection at any Regional Office of the Occupational Safety and Health Administration (OSHA), or at the OSHA Docket Office, U.S. Department of Labor, 200 Constitution Avenue NW, Room N–3508, Washington, DC 20210; telephone: 202–693–2350 (TTY number: 877–889–5627). These standards are also available for inspection at the National Archives and Records Administration (NARA). For information on the availability of these standards at NARA, telephone: 202–741–6030, or go to *www.archives.gov/federalregister/cfr/ibr-locations.html.*

* * * * *

(h) The following material is available from the International Labour Organization (ILO), 4 route des Morillons, CH–1211 Genève 22, Switzerland; telephone: +41 (0) 22 799 6111; fax: +41 (0) 22 798 8685; website: *www.ilo.org/.*

(1) Guidelines for the Use of the ILO International Classification of Radiographs of Pneumoconioses, Revised Edition 2011, Occupational safety and health series; 22 (Rev.2011), IBR approved for § 1915.1001.

(2) [Reserved]

* * * * *

Subpart F—General Working Conditions

■ 17. Revise paragraph (b)(33) of § 1915.80 to read as follows:

§ 1915.80 Scope, application, definitions, and effective dates.

* * * * *

(b) * * *

(33) *Vermin.* Insects, birds, rodents and other animals that may create safety and health hazards for employees.

* * * * *

Subpart Z—Toxic and Hazardous Substances

■ 18. Amend § 1915.1001 by revising paragraph (m)(2)(ii)(C) and appendices D and E and I, sections III and IV, to read as follows:

§ 1915.1001 Asbestos.

* * * * *

(m) * * *

(2) * * *

(ii) * * *

(C) A physical examination directed to the pulmonary and gastrointestinal systems, including a 14- by 17-inch or other reasonably-sized standard film or digital posterior-anterior chest X-ray to be administered at the discretion of the

physician, and pulmonary function tests of forced vital capacity (FVC) and forced expiratory volume at one second (FEV_1). Classification of all chest X-rays shall be conducted in accordance with appendix E to this section.

* * * * *

BILLING CODE 4510–26–P

APPENDIX D TO § 1915.1001—MEDICAL QUESTIONNAIRES; MANDATORY

This mandatory appendix contains the medical questionnaires that must be administered to all employees who are exposed to asbestos, tremolite, anthophyllite, actinolite, or a combination of these minerals above the permissible exposure limit (0.1 f/cc), and who will therefore be included in their employer's medical surveillance program. Part 1 of this appendix contains the Initial Medical Questionnaire, which must be obtained for all new hires who will be covered by the medical surveillance requirements. Part 2 includes the abbreviated Periodical Medical Questionnaire, which must be administered to all employees who are provided periodic medical examinations under the medical surveillance provisions of the standard in this section.

Part 1
INITIAL MEDICAL QUESTIONNAIRE

1. NAME_____

2. CLOCK NUMBER_____

3. PRESENT OCCUPATION_____

4. PLANT _____

5. ADDRESS_____

6. _____
(Zip Code)

7. TELEPHONE NUMBER_____

8. INTERVIEWER_____

9. DATE _____

10. Date of Birth _____
Month Day Year

11. Place of Birth _____

12. Sex
1. Male ___
2. Female ___

13. What is your marital status?
1. Single ___
2. Married ___
3. Widowed ___
4. Separated/ Divorced ___

14. Race (Check all that apply)

1. White ___
2. Black or African American ___
3. Asian ___
4. Hispanic or Latino ___
5. American Indian or Alaska Native ___
6. Native Hawaiian or Other Pacific Islander ___

15. What is the highest grade completed in school? _____
(For example 12 years is completion of high school)

OCCUPATIONAL HISTORY

16A. Have you ever worked full time (30 hours per week or more) for 6 months or more? 1. Yes ___ 2. No ___

IF YES TO 16A:

B. Have you ever worked for a year or more in any dusty job? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

Specify job/industry _____ Total Years Worked ___

Was dust exposure: 1. Mild ___ 2. Moderate ___ 3. Severe ___

C. Have you ever been exposed to gas or chemical fumes in your work? 1. Yes ___ 2. No ___

Specify job/industry _____ Total Years Worked ___

Was exposure: 1. Mild ____ 2. Moderate ___ 3. Severe ___

D. What has been your usual occupation or job—the one you have worked at the longest?

1. Job occupation _____

2. Number of years employed in this occupation _____

3. Position/job title _____

4. Business, field or industry _____

(Record on lines the years in which you have worked in any of these industries, e.g. 1960-1969)

Have you ever worked:	YES	NO
E. In a mine?	_____	_____
F. In a quarry?	_____	_____
G. In a foundry?	_____	_____
H. In a pottery?	_____	_____
I. In a cotton, flax or hemp mill?....	_____	_____
J. With asbestos?	_____	_____

17. PAST MEDICAL HISTORY	YES	NO
A. Do you consider yourself to be in good health?	_____	_____
If "NO" state reason _____		
B. Have you any defect of vision?	_____	_____
If "YES" state nature of defect _____		
C. Have you any hearing defect?	_____	_____
If "YES" state nature of defect _____		

D. Are you suffering from or have you ever suffered from:	YES	NO
a. Epilepsy (or fits, seizures, convulsions)?	_____	_____
b. Rheumatic fever?	_____	_____
c. Kidney disease?	_____	_____
d. Bladder disease?	_____	_____
e. Diabetes?	_____	_____
f. Jaundice?	_____	_____

18. CHEST COLDS AND CHEST ILLNESSES

18A. If you get a cold, does it "usually" go to your chest? (Usually means more than 1/2 the time)	1. Yes ___ 2. No ___ 3. Don't get colds ___
19A. During the past 3 years, have you had any chest illnesses that have kept you off work, indoors at home, or in bed?	1. Yes ___ 2. No ___

IF YES TO 19A:

B. Did you produce phlegm with any of these chest illnesses?	1. Yes ___ 2. No ___ 3. Does Not Apply ___
C. In the last 3 years, how many such illnesses with (increased) phlegm did you have which lasted a week or more?	Number of illnesses ___ No such illnesses ___
20. Did you have any lung trouble before the age of 16?	1. Yes ___ 2. No ___

21. Have you ever had any of the following?

1A. Attacks of bronchitis? 1. Yes ___ 2. No ___

IF YES TO 1A:

B. Was it confirmed by a doctor? 1. Yes ___ 2. No ___
3. Does Not Apply ___

C. At what age was your first attack? Age in Years ___
Does Not Apply ___

2A. Pneumonia (include bronchopneumonia)? 1. Yes ___ 2. No ___

IF YES TO 2A:

B. Was it confirmed by a doctor? 1. Yes ___ 2. No ___
3. Does Not Apply ___

C. At what age did you first have it? Age in Years ___
Does Not Apply ___

3A. Hay Fever? 1. Yes ___ 2. No ___

IF YES TO 3A:

B. Was it confirmed by a doctor? 1. Yes ___ 2. No ___
3. Does Not Apply ___

C. At what age did it start? Age in Years ___
Does Not Apply ___

22A. Have you ever had chronic bronchitis? 1. Yes ___ 2. No ___

IF YES TO 22A:

B. Do you still have it? 1. Yes ___ 2. No ___
3. Does Not Apply ___

C. Was it confirmed by a doctor? 1. Yes ___ 2. No ___
3. Does Not Apply ___

D. At what age did it start? Age in Years ___
Does Not Apply ___

23A. Have you ever had emphysema? 1. Yes ___ 2. No ___

IF YES TO 23A:

B. Do you still have it? 1. Yes ___ 2. No ___
3. Does Not Apply ___

C. Was it confirmed by a doctor? 1. Yes ___ 2. No ___
3. Does Not Apply ___

D. At what age did it start? Age in Years ___
Does Not Apply ___

24A. Have you ever had asthma? 1. Yes ___ 2. No ___

IF YES TO 24A:

B. Do you still have it? 1. Yes ___ 2. No ___
3. Does Not Apply ___

C. Was it confirmed by a doctor? 1. Yes ___ 2. No ___
3. Does Not Apply ___

D. At what age did it start? Age in Years ___
Does Not Apply ___

E. If you no longer have it, at what age did it stop? Age stopped ___
Does Not Apply ___

25. Have you ever had:

A. Any other chest illness? 1. Yes ___ 2. No ___

If yes, please specify _____

B. Any chest operations? 1. Yes ___ 2. No ___

If yes, please specify _____

C. Any chest injuries? 1. Yes ___ 2. No ___

If yes, please specify _____

26A. Has a doctor ever told you that you had heart trouble? 1. Yes ___ 2. No ___

IF YES TO 26A:

B. Have you ever had treatment for heart trouble in the past 10 years? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

27A. Has a doctor told you that you had high blood pressure? 1. Yes ___ 2. No ___

IF YES TO 27A:

B. Have you had any treatment for high blood pressure (hypertension) in the past 10 years? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

28. When did you last have your chest X-rayed? (Year) ___ ___ ___ ___

29. Where did you last have your chest X-rayed (if known)? _____

What was the outcome? _____

FAMILY HISTORY

30. Were either of your natural parents ever told by a doctor that they had a chronic lung condition such as:	FATHER			MOTHER		
	1. Yes	2. No	3. Don't know	1. Yes	2. No	3. Don't know
A. Chronic Bronchitis?	___	___	___	___	___	___
B. Emphysema?	___	___	___	___	___	___
C. Asthma?	___	___	___	___	___	___
D. Lung cancer?	___	___	___	___	___	___
E. Other chest conditions?	___	___	___	___	___	___
F. Is parent currently alive?	___	___	___	___	___	___
G. Please Specify	___ Age if Living ___ Age at Death ___ Don't Know			___ Age if Living ___ Age at Death ___ Don't Know		
H. Please specify cause of death	_____			_____		

COUGH

31A. Do you usually have a cough? (Count a cough with first smoke or on first going out of doors. Exclude clearing of throat.) (If no, skip to question 31C.)	1. Yes ___	2. No ___
B. Do you usually cough as much as 4 to 6 times a day 4 or more days out of the week?	1. Yes ___	2. No ___
C. Do you usually cough at all on getting up or first thing in the morning?	1. Yes ___	2. No ___

D. Do you usually cough at all during the rest of the day or at night? 1. Yes ___ 2. No ___

IF YES TO ANY OF ABOVE (31A, B, C, OR D), ANSWER THE FOLLOWING. IF NO TO ALL, CHECK "DOES NOT APPLY" AND SKIP TO NEXT PAGE

E. Do you usually cough like this on most days for 3 consecutive months or more during the year? 1. Yes ___ 2. No ___ 3. Does not apply ___

F. For how many years have you had the cough? Number of years ___ Does not apply ___

32A. Do you usually bring up phlegm from your chest? Count phlegm with the first smoke or on first going out of doors. Exclude phlegm from the nose. Count swallowed phlegm.) (If no, skip to 32C) 1. Yes ___ 2. No ___

B. Do you usually bring up phlegm like this as much as twice a day 4 or more days out of the week? 1. Yes ___ 2. No ___

C. Do you usually bring up phlegm at all on getting up or first thing in the morning? 1. Yes ___ 2. No ___

D. Do you usually bring up phlegm at all on during the rest of the day or at night? 1. Yes ___ 2. No ___

IF YES TO ANY OF THE ABOVE (32A, B, C, OR D), ANSWER THE FOLLOWING:

IF NO TO ALL, CHECK "DOES NOT APPLY" AND SKIP TO 33A

E. Do you bring up phlegm like this on most days for 3 consecutive months or more during the year? 1. Yes ___ 2. No ___ 3. Does not apply ___

F. For how many years have you had trouble with phlegm? Number of years ___ Does not apply ___

EPISODES OF COUGH AND PHLEGM

33A. Have you had periods or episodes of (increased*) cough and phlegm lasting for 3 weeks or more each year?
*(For persons who usually have cough and/or phlegm)

1. Yes ___ 2. No ___

IF YES TO 33A

B. For how long have you had at least 1 such episode per year?

Number of years ___
Does not apply ___

WHEEZING

34A. Does your chest ever sound wheezy or whistling

1. When you have a cold? 1. Yes ___ 2. No ___

2. Occasionally apart from colds? 1. Yes ___ 2. No ___

3. Most days or nights? 1. Yes ___ 2. No ___

B. For how many years has this been present?

Number of years ___
Does not apply ___

35A. Have you ever had an attack of wheezing that has made you feel short of breath? 1. Yes ___ 2. No ___

IF YES TO 35A

B. How old were you when you had your first such attack?

Age in years ___
Does not apply ___

C. Have you had 2 or more such episodes? 1. Yes ___ 2. No ___ 3. Does not apply ___

D. Have you ever required medicine or treatment for the(se) attack(s)? 1. Yes ___ 2. No ___ 3. Does not apply ___

BREATHLESSNESS

36. If disabled from walking by any condition other than heart or lung disease, please describe and proceed to question 38A.

Nature of condition(s)
_____
_____

37A. Are you troubled by shortness of breath when hurrying on the level or walking up a slight hill?

1. Yes ___ 2. No ___

IF YES TO 37A

B. Do you have to walk slower than people of your age on the level because of breathlessness?

1. Yes ___ 2. No ___
3. Does not apply ___

C. Do you ever have to stop for breath when walking at your own pace on the level?

1. Yes ___ 2. No ___
3. Does not apply ___

D. Do you ever have to stop for breath after walking about 100 yards (or after a few minutes) on the level?

1. Yes ___ 2. No ___
3. Does not apply ___

E. Are you too breathless to leave the house or breathless on dressing or climbing one flight of stairs?

1. Yes ___ 2. No ___
3. Does not apply ___

TOBACCO SMOKING

38A. Have you ever smoked cigarettes?
(No means less than 20 packs of cigarettes or 12 oz. of tobacco in a lifetime or less than 1 cigarette a day for 1 year.)

1. Yes ___ 2. No ___

IF YES TO 38A

B. Do you now smoke cigarettes (as of one month ago)

1. Yes ___ 2. No ___
3. Does not apply ___

C. How old were you when you first started regular cigarette smoking?	Age in years ___ Does not apply ___
D. If you have stopped smoking cigarettes completely, how old were you when you stopped?	Age stopped ___ Check if still smoking ___ Does not apply ___
E. How many cigarettes do you smoke per day now?	Cigarettes per day ___ Does not apply ___
F. On the average of the entire time you smoked, how many cigarettes did you smoke per day?	Cigarettes per day ___ Does not apply ___
G. Do or did you inhale the cigarette smoke?	1. Does not apply ___ 2. Not at all ___ 3. Slightly ___ 4. Moderately ___ 5. Deeply ___
39A. Have you ever smoked a pipe regularly? (Yes means more than 12 oz. of tobacco in a lifetime.)	1. Yes ___ 2. No ___

IF YES TO 39A

FOR PERSONS WHO HAVE EVER SMOKED A PIPE

B. 1. How old were you when you started to smoke a pipe regularly?	Age ___
2. If you have stopped smoking a pipe completely, how old were you when you stopped?	Age stopped ___ Check if still smoking pipe ___ Does not apply ___

C. On the average over the entire time you smoked a pipe, how much pipe tobacco did you smoke per week?	___ oz. per week (a standard pouch of tobacco contains 1 1/2 oz.) ___ Does not apply
D. How much pipe tobacco are you smoking now?	oz. per week ___ Not currently smoking a pipe ___
E. Do you or did you inhale the pipe smoke?	1. Never smoked ___ 2. Not at all ___ 3. Slightly ___ 4. Moderately ___ 5. Deeply ___
40A. Have you ever smoked cigars regularly?	1. Yes ___ 2. No ___ (Yes means more than 1 cigar a week for a year)

IF YES TO 40A

FOR PERSONS WHO HAVE EVER SMOKED A CIGAR

B. 1. How old were you when you started smoking cigars regularly?	Age ___
2. If you have stopped smoking cigars completely, how old were you when you stopped smoking cigars?	Age stopped ___ Check if still ___ Does not apply ___
C. On the average over the entire time you smoked cigars, how many cigars did you smoke per week?	Cigars per week ___ Does not apply ___
D. How many cigars are you smoking per week now?	Cigars per week ___ Check if not smoking cigars currently ___
E. Do or did you inhale the cigar	1. Never smoked ___

smoke?	2. Not at all ___ 3. Slightly ___ 4. Moderately ___ 5. Deeply ___

Signature _____ Date _____

Part 2
PERIODIC MEDICAL QUESTIONNAIRE

1. NAME _____

2. CLOCK NUMBER ___ ___ ___ ___ ___ ___ ___

3. PRESENT OCCUPATION _____

4. PLANT _____

5. ADDRESS _____

6. _____
(Zip Code)

7. TELEPHONE NUMBER _____

8. INTERVIEWER _____

9. DATE _____

10. What is your marital status? 1. Single ___ 2. Married ___ 3. Widowed ___ 4. Separated/ Divorced ___

11. OCCUPATIONAL HISTORY

11A. In the past year, did you work full time (30 hours per week or more) for 6 months or more? 1. Yes ___ 2. No ___

IF YES TO 11A:

11B. In the past year, did you work in a dusty job? 1. Yes ___ 2. No ___ 3. Does not Apply ___

11C. Was dust exposure: 1. Mild ___ 2. Moderate ___ 3. Severe ___

11D. In the past year, were you exposed to gas or chemical fumes in your work? 1. Yes ___ 2. No ___

11E. Was exposure: 1. Mild ___ 2. Moderate ___ 3. Severe ___

11F. In the past year, what was your:
1. Job/occupation? _____
2. Position/job title? _____

12. RECENT MEDICAL HISTORY

12A. Do you consider yourself to be in good health? Yes ___ No ___

If NO, state reason _____

12B. In the past year, have you developed:

	Yes	No
Epilepsy?	___	___
Rheumatic fever?	___	___
Kidney disease?	___	___
Bladder disease?	___	___
Diabetes?	___	___
Jaundice?	___	___
Cancer?	___	___

13. CHEST COLDS AND CHEST ILLNESSES

13A. If you get a cold, does it "usually" go to your chest? (usually means more than 1/2 the time)
1. Yes ___ 2. No ___
3. Don't get colds ___

14A. During the past year, have you had any chest illnesses that have kept you off work, indoors at home, or in bed?
1. Yes ___ 2. No ___
3. Does Not Apply ___

IF YES TO 14A:

14B. Did you produce phlegm with any of these chest illnesses?
1. Yes ___ 2. No ___
3. Does Not Apply ___

14C. In the past year, how many such illnesses with (increased) phlegm did you have which lasted a week or more?
Number of illnesses ___
No such illnesses ___

15. RESPIRATORY SYSTEM

In the past year have you had:

	Yes or No	Further Comment on Positive Answers
Asthma	_____	
Bronchitis	_____	
Hay Fever	_____	
Other Allergies	_____	

	Yes or No	Further Comment on Positive Answers
Pneumonia	_____	
Tuberculosis	_____	
Chest Surgery	_____	
Other Lung Problems	_____	
Heart Disease	_____	

Do you have:

	Yes or No	Further Comment on Positive Answers
Frequent colds	_____	
Chronic cough	_____	
Shortness of breath when walking or climbing one flight or stairs	_____	

Do you:

Wheeze	_____	
Cough up phlegm	_____	
Smoke cigarettes	_____	Packs per day ____ How many years ___

Date _____ Signature _____

BILLING CODE 4510–26–C

Appendix E to § 1915.1001—Classification of Chest X-Rays. Mandatory

(a) Chest X-rays shall be classified in accordance with the Guidelines for the use of the ILO International Classification of Radiographs of Pneumoconioses (revised edition 2011) (incorporated by reference, see § 1915.5), and recorded on a classification form following the format of the CDC/NIOSH (M) 2.8 form. As a minimum, the content within the bold lines of this form (items 1 through 4) shall be included. This form is not to be submitted to NIOSH.

(b) All X-rays shall be classified only by a B-Reader, a board eligible/certified radiologist, or an experienced physician with known expertise in pneumoconioses.

(c) Whenever classifying chest X-ray film, the physician shall have immediately available for reference a complete set of the ILO standard format radiographs provided for use with the Guidelines for the use of the ILO International Classification of Radiographs of Pneumoconioses (revised edition 2011).

(d) Whenever classifying digitally-acquired chest X-rays, the physician shall have immediately available for reference a complete set of ILO standard digital chest radiographic images provided for use with the Guidelines for the Use of the ILO International Classification of Radiographs of Pneumoconioses (revised edition 2011). Classification of digitally-acquired chest X-rays shall be based on the viewing of images displayed as electronic copies and shall not be based on the viewing of hard copy printed transparencies of images.

* * * * *

Appendix I to § 1915.1001—Medical Surveillance Guidelines for Asbestos, Non-Mandatory

* * * * *

III. Signs and Symptoms of Exposure-Related Disease

The signs and symptoms of lung cancer or gastrointestinal cancer induced by exposure to asbestos are not unique, except that a chest X-ray of an exposed patient with lung cancer may show pleural plaques, pleural calcification, or pleural fibrosis, and may also show asbestosis (*i.e.,* small irregular parenchymal opacities). Symptoms characteristic of mesothelioma include shortness of breath, pain in the chest or abdominal pain. Mesothelioma has a much longer average latency period compared with lung cancer (40 years versus 15–20 years), and mesothelioma is therefore more likely to be found among workers who were first exposed to asbestos at an early age. Mesothelioma is a fatal disease.

Asbestosis is pulmonary fibrosis caused by the accumulation of asbestos fibers in the lungs. Symptoms include shortness of breath, coughing, fatigue, and vague feelings of

sickness. When the fibrosis worsens, shortness of breath occurs even at rest. The diagnosis of asbestosis is most commonly based on a history of exposure to asbestos, the presence of characteristic radiologic abnormalities, end-inspiratory crackles (rales), and other clinical features of fibrosing lung disease. Pleural plaques and thickening may be observed on chest X-rays. Asbestosis is often a progressive disease even in the absence of continued exposure, although this appears to be a highly individualized characteristic. In severe cases, death may be caused by respiratory or cardiac failure.

IV. Surveillance and Preventive Considerations

As noted in section III of this appendix, exposure to asbestos have been linked to an increased risk of lung cancer, mesothelioma, gastrointestinal cancer, and asbestosis among occupationally exposed workers. Adequate screening tests to determine an employee's potential for developing serious chronic diseases, such as a cancer, from exposure to asbestos do not presently exist. However, some tests, particularly chest X-rays and pulmonary function tests, may indicate that an employee has been overexposed to asbestos increasing his or her risk of developing exposure related chronic diseases. It is important for the physician to become familiar with the operating conditions in which occupational exposure to asbestos is likely to occur. This is particularly important in evaluating medical and work histories and in conducting physical examinations. When an active employee has been identified as having been overexposed to asbestos measures taken by the employer to eliminate or mitigate further exposure should also lower the risk of serious long-term consequences.

The employer is required to institute a medical surveillance program for all employees who are or will be exposed to asbestos at or above the permissible exposure limits (0.1 fiber per cubic centimeter of air) for 30 or more days per year and for all employees who are assigned to wear a negative-pressure respirator. All examinations and procedures must be performed by or under the supervision of licensed physician at a reasonable time and place, and at no cost to the employee.

Although broad latitude is given to the physician in prescribing specific tests to be included in the medical surveillance program, OSHA requires inclusion of the following elements in the routine examination,

(i) Medical and work histories with special emphasis directed to symptoms of the respiratory system, cardiovascular system, and digestive tract.

(ii) Completion of the respiratory disease questionnaire contained in appendix D to this section.

(iii) A physical examination including a chest X-ray and pulmonary function test that includes measurement of the employee's forced vital capacity (FVC) and forced expiratory volume at one second (FEV_1).

(iv) Any laboratory or other test that the examining physician deems by sound medical practice to be necessary.

The employer is required to make the prescribed tests available at least annually to those employees covered; more often than specified if recommended by the examining physician; and upon termination of employment.

The employer is required to provide the physician with the following information: A copy of the standard in this section (including all appendices to this section); a description of the employee's duties as they relate to asbestos exposure; the employee's representative level of exposure to asbestos; a description of any personal protective and respiratory equipment used; and information from previous medical examinations of the affected employee that is not otherwise available to the physician. Making this information available to the physician will aid in the evaluation of the employee's health in relation to assigned duties and fitness to wear personal protective equipment, if required.

The employer is required to obtain a written opinion from the examining physician containing the results of the medical examination; the physician's opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of exposure-related disease; any recommended limitations on the employee or on the use of personal protective equipment; and a statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions related to asbestos exposure that require further explanation or treatment. This written opinion must not reveal specific findings or diagnoses unrelated to exposure to asbestos, and a copy of the opinion must be provided to the affected employee.

* * * * *

PART 1926—SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION

Subpart A—General

■ 19. The authority citation for part 1926, subpart A, continues to read as follows:

Authority: 40 U.S.C. 3701 *et seq.;* 29 U.S.C. 653, 655, 657; Secretary of Labor's Order No. 12–71 (36 FR 8754), 8–76 (41 FR 25059), 9–83 (48 FR 35736), 1–90 (55 FR 9033), 6–96 (62 FR 111), 3–2000 (65 FR 50017), 5–2002 (67 FR 65008), or 5–2007 (72 FR 31160), 5–2007 (72 FR 31160), 4–2010 (75 FR 55355), or 1–2012 (77 FR 3912), as applicable; and 29 CFR part 1911.

■ 20. Amend § 1926.6 by:

■ a. Revising paragraphs (a) through (c).

■ b. Redesignating paragraphs (g) through (ff) as follows:

Old paragraphs	New paragraphs
(g) and (h)	(d) and (e).
(j)	(g).
(k)	(i).
(l)	(h).
(m) through (p)	(j) through (m).
(u) through (w)	(n) through (p).
(x) and (y)	(r) and (s).
(aa)	(t).
(dd) and (ee)	(u) and (v).
(ff)	(f).

■ c. Adding reserved paragraph (d)(2).

■ d. Revising newly redesignated paragraphs (f)(1) and (2) and removing newly redesignated (f)(3) and (4).

■ e. Adding reserved paragraphs (i)(2), (l)(2), and (m)(2).

■ f. Revising newly designating paragraph (n).

■ g. Adding reserved paragraph (o)(2).

■ h. Adding paragraph (q).

■ i. Further redesignating newly redesignated paragraphs (r)(1) through (3) as paragraphs (r)(4) through (6) and adding new paragraphs (r)(1) through (3).

■ j. Revising newly redesignated paragraphs (t)(2) and (u).

■ k. Adding reserved paragraph (v)(2).

■ l. Removing reserved paragraphs (z), (bb), and (cc).

The revisions and additions read as follows:

§ 1926.6 Incorporation by reference.

(a) The standards of agencies of the U.S. Government, and organizations which are not agencies of the U.S. Government which are incorporated by reference in this part, have the same force and effect as other standards in this part. Only the mandatory provisions (*i.e.,* provisions containing the word ''shall'' or other mandatory language) of standards incorporated by reference are adopted as standards under the Occupational Safety and Health Act.

(b) The standards listed in this section are incorporated by reference into this part with the approval of the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in this section, OSHA must publish a document in the **Federal Register** and the material must be available to the public.

(c) Copies of standards listed in this section and issued by private standards organizations are available for purchase from the issuing organizations at the addresses or through the other contact information listed below for these private standards organizations. In addition, the standards are available for inspection at any Regional Office of the Occupational Safety and Health Administration (OSHA), or at the OSHA Docket Office, U.S. Department of Labor, 200 Constitution Avenue NW, Room N–3508, Washington, DC 20210; telephone: 202–693–2350 (TTY number: 877–889–5627). These standards are also available for inspection at the

National Archives and Records Administration (NARA). For information on the availability of these standards at NARA, telephone: 202–741–6030, or go to *www.archives.gov/federal-register/cfr/ibr-locations.html.*

* * * * *

(f) * * *

(1) ANSI B15.1–1953 (R1958), Safety Code for Mechanical Power-Transmission Apparatus, revised 1958, IBR approved for § 1926.300(b)(2).

(2) ANSI B30.5–1968, Crawler, Locomotive, and Truck Cranes, approved Dec. 16, 1968, IBR approved for § 1926.1433(a).

* * * * *

(n) The following material is available from the Federal Highway Administration, United States Department of Transportation, 1200 New Jersey Avenue SE, Washington, DC 20590; telephone: 202–366–4000; website: *www.fhwa.dot.gov/:*

(1) Manual on Uniform Traffic Control Devices for Streets and Highways, 2009 Edition, December 2009 (including Revision 1 dated May 2012 and Revision 2 dated May 2012), (''MUTCD'') IBR approved for §§ 1926.200(g) and 1926.201(a).

(2) [Reserved]

* * * * *

(q) The following material is available from the International Labour Organization (ILO), 4 route des Morillons, CH–1211 Genève 22, Switzerland; telephone: +41 (0) 22 799 6111; fax: +41 (0) 22 798 8685; website:*//www.ilo.org/:*

(1) Guidelines for the Use of the ILO International Classification of Radiographs of Pneumoconioses, Revised Edition 2011, Occupational safety and health series; 22 (Rev.2011), IBR approved for § 1926.1101.

(2) [Reserved]

(r) * * *

(1) ISO 3471:2008(E), Earth-moving machinery—Roll-over protective structures—Laboratory tests and performance requirements, Fourth Edition, Aug. 8, 2008 (''ISO 3471:2008''), IBR approved for §§ 1926.1001(c) and 1926.1002(c).

(2) ISO 5700:2013(E), Tractors for agriculture and forestry—Roll-over protective structures—Static test method and acceptance conditions, Fifth Edition, May 1, 2013 (''ISO 5700:2013''), IBR approved for § 1926.1002(c).

(3) ISO 27850:2013(E), Tractors for agriculture and forestry—Falling object protective structures—Test procedures and performance requirements, First Edition, May.01, 2013 (''ISO 27850:2013''), IBR approved for § 1926.1003(c).

* * * * *

(t) * * *

(2) PCSA Std. No. 2, Mobile Hydraulic Crane Standards, 1968 (''PCSA Std. No. 2 (1968)''), IBR approved for §§ 1926.602(b) and 1926.1433(a).

* * * * *

(u) The following material is available from the Society of Automotive Engineers (SAE), 400 Commonwealth Drive, Warrendale, PA 15096; telephone: 1–877–606–7323; fax: 724–776–0790; website: *www.sae.org/:*

(1) SAE 1970 Handbook, IBR approved for § 1926.602(b).

(2) SAE J166–1971, Trucks and Wagons, IBR approved for § 1926.602(a).

(3) SAE J167, Protective Frame with Overhead Protection-Test Procedures and Performance Requirements, approved July 1970, IBR approved for § 1926.1003(b).

(4) SAE J168, Protective Enclosures-Test Procedures and Performance Requirements, approved July 1970, IBR approved for § 1926.1002(b).

(5) SAE J185 (reaf. May 2003), Access Systems for Off-Road Machines, reaffirmed May 2003 (''SAE J185 (May 1993)''), IBR approved for § 1926.1423(c).

(6) SAE J236–1971, Self-Propelled Graders, IBR approved for § 1926.602(a).

(7) SAE J237–1971, Front End Loaders and Dozers, IBR approved for § 1926.602(a).

(8) SAE J319b–1971, Self-Propelled Scrapers, IBR approved for § 1926.602(a).

(9) SAE J320a, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired, Self-Propelled Scrapers, revised July 1969 (editorial change July 1970), IBR approved for § 1926.1001(b).

(10) SAE J321a–1970, Fenders for Pneumatic-Tired Earthmoving Haulage Equipment, IBR approved for § 1926.602(a).

(11) SAE J333a–1970, Operator Protection for Agricultural and Light Industrial Tractors, IBR approved for § 1926.602(a).

(12) SAE J334a, Protective Frame Test Procedures and Performance Requirements, revised July 1970, IBR approved for § 1926.1002(b).

(13) SAE J386–1969, Seat Belts for Construction Equipment, IBR approved for § 1926.602(a).

(14) SAE J394, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired Front End Loaders and Rubber-Tired Dozers, approved July 1969 (editorial change July 1970), IBR approved for § 1926.1001(b).

(15) SAE J395, Minimum Performance Criteria for Roll-Over Protective Structure for Crawler Tractors and Crawler-Type Loaders, approved July 1969 (editorial change July 1970), IBR approved for § 1926.1001(b).

(16) SAE J396, Minimum Performance Criteria for Roll-Over Protective Structure for Motor Graders, approved July 1969 (editorial change July 1970), IBR approved for § 1926.1001(b).

(17) SAE J397, Critical Zone Characteristics and Dimensions for Operators of Construction and Industrial Machinery, approved July 1969, IBR approved for § 1926.1001(b).

(18) SAE J987 (rev. Jun. 2003), Lattice Boom Cranes—Method of Test, revised Jun. 2003 (''SAE J987 (Jun. 2003)''), IBR approved for § 1926.1433(c).

(19) SAE J1063 (rev. Nov. 1993), Cantilevered Boom Crane Structures—Method of Test, revised Nov. 1993 (''SAE J1063 (Nov. 1993)''), IBR approved for § 1926.1433(c).

* * * * *

Subpart D—Occupational Health and Environmental Controls

■ 21. Revise the authority citation for part 1926, subpart D, to read as follows:

Authority: 40 U.S.C. 3704; 29 U.S.C. 653, 655, and 657; and Secretary of Labor's Order No. 12–71 (36 FR 8754), 8–76 (41 FR 25059), 9–83 (48 FR 35736), 1–90 (55 FR 9033), 6–96 (62 FR 111), 3–2000 (65 FR 50017), 5–2002 (67 FR 65008), 5–2007 (72 FR 31159), 4–2010 (75 FR 55355), or 1–2012 (77 FR 3912) as applicable; and 29 CFR part 1911.

Sections 1926.59, 1926.60, and 1926.65 also issued under 5 U.S.C. 553 and 29 CFR part 1911.

Section 1926.61 also issued under 49 U.S.C. 1801–1819 and 5 U.S.C. 553.

Section 1926.62 also issued under sec. 1031, Public Law 102–550, 106 Stat. 3672 (42 U.S.C. 4853).

Section 1926.65 also issued under sec. 126, Public Law 99–499, 100 Stat. 1614 (reprinted at 29 U.S.C.A. 655 Note) and 5 U.S.C. 553.

■ 22. Revise paragraph (f) of § 1926.50 to read as follows:

§ 1926.50 Medical services and first aid.

* * * * *

(f)(1) In areas where 911 emergency dispatch services are not available, the telephone numbers of the physicians, hospitals, or ambulances shall be conspicuously posted.

(2) In areas where 911 emergency dispatch services are available and an employer uses a communication system for contacting necessary emergency-medical service, the employer must:

(i) Ensure that the communication system is effective in contacting the emergency-medical service; and

(ii)(A) When using a communication system in an area that does not

automatically supply the caller's latitude and longitude information to the 911 emergency dispatcher, the employer must post in a conspicuous location at the worksite either:

(1) The latitude and longitude of the worksite; or

(2) Other location-identification information that communicates effectively to employees the location of the worksite.

(B) The requirement specified in paragraph (f)(2)(ii)(A) of this section does not apply to worksites with readily available telephone land lines that have 911 emergency service that automatically identifies the location of the caller.

* * * * *

■ 23. Amend § 1926.55 by:

■ a. Revising paragraphs (a) and (c);

■ b. Removing the heading for appendix A;

■ c. Designating the table entitled ''Threshold Limit Values of Airborne Contaminants for Construction'' as Table 1 to § 1926.55 and revising the table heading;

■ d. In newly designated Table 1:

■ i. Revising the fourth and fifth column headings;

■ ii. Removing the entry for ''Asbestos; see 1926.58'' and adding in its place the entry ''Asbestos; see § 1926.1101'';

■ iii. Removing the entry for ''Coke oven emissions; see § 1926.1129'';

■ iv. Removing the entry for ''Talc (containing asbestos); use asbestos limit; see 1926.58'' and adding in its place the entry ''Talc (containing asbestos); use asbestos limit; see § 1926.1101''; and

■ v. Removing the entry for ''Tremolite, asbestiform; see 1926.58'' and adding in its place the entry ''Tremolite, asbestiform; see § 1926.1101'';

■ e. Designating the table entitled ''Mineral Dusts'' as Table 2 to § 1926.55;

■ f. Following newly designated Table 2, removing the word ''Footnotes'' and adding in its place ''Footnotes to Tables 1 and 2 of this section:'';

■ g. Revising footnotes 2 and 3;

■ h. Removing and reserving footnote 4;

■ i. Revising footnote 5 and the footnote designated by a single asterisk; and

■ j. Removing the footnote designated by double asterisks.

The revisions read as follows:

§ 1926.55 Gases, vapors, fumes, dusts, and mists.

(a) Employers must limit an employee's exposure to any substance listed in Table 1 or 2 of this section in accordance with the following:

(1) *Substances with limits preceded by (C)—Ceiling Values.* An employee's exposure, as determined from breathing-zone air samples, to any substance in Table 1 of this section with a permissible exposure limit preceded by (C) must at no time exceed the exposure limit specified for that substance. If instantaneous monitoring is not feasible, then the employer must assess the ceiling as a 15-minute time-weighted average exposure that the employer cannot exceed at any time during the working day.

(2) *Other substances—8-hour Time Weighted Averages.* An employee's exposure, as determined from breathing-zone air samples, to any substance in Table 1 or 2 of this section with a permissible exposure limit not preceded by (C) must not exceed the limit specified for that substance measured as an 8-hour time-weighted average in any work shift.

* * * * *

(c) Paragraphs (a) and (b) of this section do not apply to the exposure of employees to airborne asbestos, tremolite, anthophyllite, or actinolite dust. Whenever any employee is exposed to airborne asbestos, tremolite, anthophyllite, or actinolite dust, the requirements of § 1926.1101 shall apply.

* * * * *

TABLE 1 TO § 1926.55—PERMISSIBLE EXPOSURE LIMITS FOR AIRBORNE CONTAMINANTS

Substance	CAS No.[d]	ppm[a]	mg/m[3] [b]	Skin designation *
* * * * * * *				
Asbestos; see § 1926.1101.				
* * * * * * *				
Talc (containing asbestos); use asbestos limit; see § 1926.1101.				
* * * * * * *				
Tremolite, asbestiform; see § 1926.1101.				
* * * * * * *				
* * * * * * *				

[2] See Table 2 of this section.

[3] Use Asbestos Limit § 1926.1101.

[4] [Reserved]

[5] See Table 2 of this section for the exposure limit for any operations or sectors where the exposure limit in § 1926.1153 is stayed or is otherwise not in effect.

* An ''X'' designation in the ''Skin Designation'' column indicates that the substance is a dermal hazard.

[a] Parts of vapor or gas per million parts of contaminated air by volume at 25 °C and 760 torr.

[b] Milligrams of substance per cubic meter of air. When entry is in this column only, the value is exact; when listed with a ppm entry, it is approximate.

* * * * * * *

[d] The CAS number is for information only. Enforcement is based on the substance name. For an entry covering more than one metal compound, measured as the metal, the CAS number for the metal is given—not CAS numbers for the individual compounds.

* * * * *

■ 24. Revise § 1926.64 to read as follows:

§ 1926.64 Process safety management of highly hazardous chemicals.

For requirements regarding the process safety management of highly hazardous chemicals as it pertains to construction work, follow the requirements in 29 CFR 1910.119.

Subpart E—Personal Protective and Life Saving Equipment

■ 25. The authority citation for part 1926, subpart E, continues to read as follows:

Authority: 40 U.S.C. 3701 *et seq.;* 29 U.S.C. 653, 655, 657; Secretary of Labor's Order No. 12–71 (36 FR 8754), 8–76 (41 FR 25059), 9–83 (48 FR 35736), 1–90 (55 FR 9033), 6–96 (62 FR 111), 5–2002 (67 FR 65008), 5–2007 (72 FR 31160), 4–2010 (75 FR 55355), or 1–2012 (77 FR 3912), as applicable; and 29 CFR part 1911.

■ 26. Revise paragraph (c) of § 1926.104 to read as follows:

§ 1926.104 Safety belts, lifelines, and lanyards.

* * * * *

(c) Lifelines used on rock-scaling operations, or in areas where the lifeline may be subjected to cutting or abrasion, shall be a minimum of 7/8-inch wire core manila rope. For all other lifeline applications, a minimum of 3/4-inch manila or equivalent, with a minimum breaking strength of 5,000 pounds, shall be used.

* * * * *

Subpart G—Signs, Signals, and Barricades

■ 27. The authority citation for part 1926, subpart G, continues to read as follows:

Authority: 40 U.S.C. 333; 29 U.S.C. 653, 655, 657; Secretary of Labor's Order No. 12–71 (36 FR 8754), 8–76 (41 FR 25059), 9–83 (48 FR 35736), 3–2000 (65 FR 50017), 5–2002 (67 FR 65008), 5–2007 (72 FR 31159), 4–2010 (75 FR 55355), or 1–2012 (77 FR 3912), as applicable; and 29 CFR part 1911.

■ 28. Revise paragraph (g) of § 1926.200 to read as follows:

§ 1926.200 Accident prevention signs, devices, and tags.

* * * * *

(g) *Traffic control signs and devices.* (1) At points of hazard, construction areas shall be posted with legible traffic control signs and protected by traffic control devices.

(2) The design and use of all traffic control devices, including signs, signals, markings, barricades, and other devices, for protection of construction workers shall conform to Part 6 of the MUTCD (incorporated by reference, see § 1926.6).

* * * * *

■ 29. Revise paragraph (a) of § 1926.201 to read as follows:

§ 1926.201 Signaling.

(a) *Flaggers.* Signaling by flaggers and the use of flaggers, including warning garments worn by flaggers, shall conform to Part 6 of the MUTCD (incorporated by reference, see § 1926.6).

* * * * *

§ 1926.202 [Removed]

■ 30. Remove § 1926.202.

§ 1926.203 [Removed]

■ 31. Remove § 1926.203.

Subpart H—Materials Handling, Storage, Use, and Disposal

■ 32. The authority citation for part 1926, subpart H, continues to read as follows:

Authority: 40 U.S.C. 3701; 29 U.S.C. 653, 655, 657; and Secretary of Labor's Order No. 12–71 (36 FR 8754), 8–76 (41 FR 25059), 9–83 (48 FR 35736), 1–90 (55 FR 9033), 4–2010 (75 FR 55355), or 1–2012 (77 FR 3912), as applicable. Section 1926.250 also issued under 29 CFR part 1911.

■ 33. Revise paragraph (a)(2) of § 1926.250 to read as follows:

§ 1926.250 General requirements for storage.

(a) * * *

(2)(i) The weight of stored materials on floors within buildings and structures shall not exceed maximum safe load limits.

(ii) Employers shall conspicuously post maximum safe load limits of floors within buildings and structures, in pounds per square foot, in all storage areas, except when the storage area is on a floor or slab on grade. Posting is not required for storage areas in all single-family residential structures and wood-framed multi-family residential structures.

* * * * *

Subpart S—Underground Construction, Caissons, Cofferdams and Compressed Air

■ 34. The authority citation for part 1926, subpart S, continues to read as follows:

Authority: 40 U.S.C. 3701; 29 U.S.C. 653, 655, 657; and Secretary of Labor's Orders 12–71 (36 FR 8754), 8–76 (41 FR 25059), 9–83 (48 FR 35736), 1–90 (55 FR 9033), 6–96 (62 FR 111), 5–2007 (72 FR 31159), or 1–2012 (77 FR 3912), as applicable.

■ 35. Revise paragraph (k)(10) of § 1926.800 to read as follows:

§ 1926.800 Underground construction.

* * * * *

(k) * * *

(10)(i) Internal combustion engines, except diesel-powered engines on mobile equipment, are prohibited underground.

(ii) Mobile diesel-powered equipment used underground in atmospheres other than gassy operations:

(A) Shall comply with MSHA provisions in 30 CFR 57.5067; or

(B) If purchased on or before July 15, 2019, may alternatively comply with MSHA provisions under 30 CFR part 32 (revised as of July 1, 1996) (formerly Schedule 24), or be demonstrated by the employer to be fully equivalent to such MSHA-approved equipment, and be operated in accordance with that part.

(iii) For purposes of this paragraph (k)(10), when an applicable MSHA provision uses the term ''mine,'' use the phrase ''underground construction site.'' (Each brake horsepower of a diesel engine requires at least 100 cubic feet (2.832 m^3) of air per minute for suitable operation in addition to the air requirements for personnel. Some engines may require a greater amount of air to ensure that the allowable levels of carbon monoxide, nitric oxide, and nitrogen dioxide are not exceeded.)

* * * * *

Subpart W—Rollover Protective Structures; Overhead Protection

■ 36. The authority citation for part 1926, subpart W, is revised to read as follows:

Authority: 40 U.S.C. 3701; 29 U.S.C. 653, 655, 657; and Secretary of Labor's Order No. 12–71 (36 FR 8754), 8–76 (41 FR 25059), 9–83 (48 FR 35736), 1–90 (55 FR 9033), 6–96 (62 FR 111), 3–2000 (65 FR 50017), 5–2002 (67 FR 65008), or 1–2012 (77 FR 3912), as applicable.

■ 37. Amend § 1926.1000 by revising the section heading and paragraphs (a) through (c) to read as follows:

§ 1926.1000 Scope.

(a) *Coverage.* This subpart applies to the following types of material handling equipment: All rubber-tired, self-propelled scrapers, rubber-tired front-end loaders, rubber-tired dozers, wheel-type agricultural and industrial tractors, crawler tractors, crawler-type loaders, and motor graders, with or without attachments, that are used in construction work. This subpart also applies to compactors and rubber-tired skid-steer equipment, with or without attachments, manufactured after July 15, 2019, that are used in construction work. This subpart does not apply to sideboom pipelaying tractors.

(b) *Equipment manufactured before* July 15, 2019. Material handling equipment described in paragraph (a) of this section (excluding compactors and rubber-tired skid-steer equipment) manufactured before July 15, 2019, shall be equipped with rollover protective

structures that meet the minimum performance standards prescribed in § 1926.1001(b), as applicable. Agricultural and industrial tractors used in construction shall be equipped with rollover protective structures that meet the minimum performance standards prescribed in § 1926.1002(b), as applicable. When overhead protection is provided on agricultural and industrial tractors, the overhead protection shall meet the minimum performance standards prescribed in § 1926.1003(b), as applicable.

(c) *Equipment manufactured on or after* July 15, 2019. Material handling machinery described in paragraph (a) of this section manufactured on or after July 15, 2019, shall be equipped with rollover protective structures that meet the minimum performance standards prescribed in § 1926.1001(c). Agricultural and industrial tractors used in construction shall be equipped with rollover protective structures that meet the minimum performance standards prescribed in § 1926.1002(c). When overhead protection is provided on agricultural and industrial tractors, the overhead protection shall meet the minimum performance standards prescribed in § 1926.1003(c).

* * * * *

■ 38. Section 1926.1001 is revised to read as follows:

§ 1926.1001 Minimum performance criteria for rollover protective structures for designated scrapers, loaders, dozers, graders, crawler tractors, compactors, and rubber-tired skid steer equipment.

(a) *General.* This section prescribes minimum performance criteria for roll-over protective structures (ROPS) for rubber-tired self-propelled scrapers; rubber-tired front end loaders and rubber-tired dozers; crawler tractors and crawler-type loaders, motor graders, compactors, and rubber-tired skid steer equipment.

(b) *Equipment manufactured before* July 15, 2019. For equipment listed in paragraph (a) of this section (excluding compactors and rubber-tired skid steer equipment) manufactured before July 15, 2019, the protective frames shall conform to the following Society of Automotive Engineers Recommended Practices as applicable: SAE J320a, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired, Self-Propelled Scrapers; SAE J394, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired Front End Loaders and Rubber-Tired Dozers; SAE J395, Minimum Performance Criteria for Roll-Over Protective Structure for Crawler Tractors and Crawler-Type Loaders; SAE J396, Minimum Performance Criteria for Roll-Over Protective Structure for Motor Graders; and SAE J397, Critical Zone Characteristics and Dimensions for Operators of Construction and Industrial Machinery, as applicable (each incorporated by reference, see § 1926.6), or comply with the consensus standard (ISO 3471:2008) listed in paragraph (c) of this section.

(c) *Equipment manufactured on or after* July 15, 2019. For equipment listed in paragraph (a) of this section manufactured on or after July 15, 2019, the protective frames shall meet the test and performance requirements of the International Organization for Standardization (ISO) standard ISO 3471:2008 Earth-Moving Machinery—Roll-over protective structures—Laboratory tests and performance requirements (incorporated by reference, see § 1926.6).

■ 39. Amend § 1926.1002 by:
■ a. Revising paragraphs (a) through (d);
■ b. Removing paragraphs (e) through (i);
■ c. Redesignating paragraph (j) as paragraph (e); and
■ d. Removing newly redesignated paragraph (e)(3) and paragraph (k).

The revisions read as follows:

§ 1926.1002 Protective frames (roll-over protective structures, known as ROPS) for wheel-type agricultural and industrial tractors used in construction.

(a) *General.* This section sets forth requirements for frames used to protect operators of wheel-type agricultural and industrial tractors used in construction work that will minimize the possibility of operator injury resulting from accidental upsets during normal operation. See paragraph (e) of this section for definitions of agricultural and industrial tractors.

(b) *Equipment manufactured before* July 15, 2019. For equipment manufactured before July 15, 2019, the protective frames shall meet the test and performance requirements of the Society of Automotive Engineers Standard J334a, Protective Frame Test Procedures and Performance Requirements and J168, Protective enclosures-test procedures and performance requirements, as applicable (incorporated by reference, see § 1926.6), or comply with the consensus standard (ISO 5700:2013) listed in paragraph (c) of this section.

(c) *Equipment manufactured on or after* July 15, 2019. For equipment manufactured on or after July 15, 2019, the protective frames shall meet the test and performance requirements of the International Organization for Standardization (ISO) standard ISO 5700:2013, Tractors for agriculture and forestry—Roll-over protective structures—static test method and acceptance conditions or ISO 3471:2008 Earth-Moving Machinery—Roll-over protective structures—Laboratory tests and performance requirements (incorporated by reference, see § 1926.6).

(d) *Overhead protection requirements.* For overhead protection requirements, see § 1926.1003.

* * * * *

■ 40. Section 1926.1003 is revised to read as follows:

§ 1926.1003 Overhead protection for operators of agricultural and industrial tractors used in construction.

(a) *General.* This section sets forth requirements for overhead protection used to protect operators of wheel-type agricultural and industrial tractors used in construction work that will minimize the possibility of operator injury resulting from overhead objects such as flying or falling objection, and from the cover itself in the event of accidental upset.

(b) *Equipment manufactured before* July 15, 2019. When overhead protection is provided on wheel-type agricultural and industrial tractors manufactured before July 15, 2019, the overhead protection shall be designed and installed according to the requirements contained in the test and performance requirements of Society of Automotive Engineers Standard J167, Protective Frame with Overhead Protection-Test Procedures and Performance Requirements, which pertains to overhead protection requirements (incorporated by reference, see § 1926.6) or comply with the consensus standard (ISO 27850:2013) listed in paragraph (c) of this section.

(c) *Equipment manufactured on or after* July 15, 2019. When overhead protection is provided on wheel-type agricultural and industrial tractors manufactured on or after July 15, 2019, the overhead protection shall be designed and installed according to the requirements contained in the test and performance requirements of the International Organization for Standardization (ISO) standard ISO 27850:2013, Tractors for agriculture and forestry—Falling object protective structures—Test procedures and performance requirements, which pertains to overhead protection requirements (incorporated by reference, see § 1926.6).

(d) *Site clearing.* In the case of machines to which § 1926.604 (relating to site clearing) also applies, the

overhead protection may be either the type of protection provided in § 1926.604, or the type of protection provided by this section.

Appendix A to Subpart W of Part 1926 [Removed]

■ 41. Remove appendix A to subpart W of part 1926.

Subpart Z—Toxic and Hazardous Substances

■ 42. The authority citation for part 1926, subpart Z, is revised to read as follows:

Authority: 40 U.S.C. 3704; 29 U.S.C. 653, 655, 657; and Secretary of Labor's Order No. 12–71 (36 FR 8754), 8–76 (41 FR 25059), 9–83 (48 FR 35736), 1–90 (55 FR 9033), 6–96 (62 FR 111), 3–2000 (65 FR 50017), 5–2002 (67 FR 65008), 5–2007 (72 FR 31160), 4–2010 (75 FR 55355), or 1–2012 (77 FR 3912) as applicable; and 29 CFR part 1911.

Section 1926.1102 not issued under 29 U.S.C. 655 or 29 CFR part 1911; also issued under 5 U.S.C. 553.

■ 43. Amend § 1926.1101 by revising paragraph (m)(2)(ii)(C) and appendices D and E and I, sections III and IV(iii), to read as follows:

§ 1926.1101 Asbestos.

* * * * *

(m) * * *

(2) * * *

(ii) * * *

(C) A physical examination directed to the pulmonary and gastrointestinal systems, including a 14- by 17-inch or other reasonably-sized standard film or digital posterior-anterior chest X-ray to be administered at the discretion of the physician, and pulmonary function tests of forced vital capacity (FVC) and forced expiratory volume at one second (FEV_1). Classification of all chest X-rays shall be conducted in accordance with appendix E to this section.

* * * * *

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APPENDIX D TO § 1926.1101—MEDICAL QUESTIONNAIRES; MANDATORY

This mandatory appendix contains the medical questionnaires that must be administered to all employees who are exposed to asbestos above permissible exposure limit, and who will therefore be included in their employer's medical surveillance program. Part 1 of this appendix contains the Initial Medical Questionnaire, which must be obtained for all new hires who will be covered by the medical surveillance requirements. Part 2 includes the abbreviated Periodical Medical Questionnaire, which must be administered to all employees who are provided periodic medical examinations under the medical surveillance provisions of the standard in this section.

Part 1

INITIAL MEDICAL QUESTIONNAIRE

1. NAME_____

2. CLOCK NUMBER_____

3. PRESENT OCCUPATION_____

4. PLANT _____

5. ADDRESS_____

6. _____
(Zip Code)

7. TELEPHONE NUMBER_____

8. INTERVIEWER_____

9. DATE _____

10. Date of Birth _____
Month Day Year

11. Place of Birth _____

12. Sex
1. Male ___
2. Female ___

13. What is your marital status?
1. Single ___
2. Married ___
3. Widowed ___
4. Separated/ Divorced ___

14. (Check all that apply)
1. White ___
2. Black or African American ___
3. Asian ___
4. Hispanic or Latino ___
5. American Indian or Alaska Native ___
6. Native Hawaiian or Other Pacific Islander ___

15. What is the highest grade completed in school? _____
(For example 12 years is completion of high school)

OCCUPATIONAL HISTORY

16A. Have you ever worked full time (30 hours per week or more) for 6 months or more? 1. Yes ___ 2. No ___

IF YES TO 16A:

B. Have you ever worked for a year or more in any dusty job? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

Specify job/industry _____ Total Years Worked ___

Was dust exposure: 1. Mild ___ 2. Moderate ___ 3. Severe ___

C. Have you ever been exposed to gas or chemical fumes in your work? 1. Yes ___ 2. No ___

Specify job/industry _____ Total Years Worked ___

Was exposure: 1. Mild ____ 2. Moderate ___ 3. Severe ___

D. What has been your usual occupation or job—the one you have worked at the longest?

1. Job occupation _____
2. Number of years employed in this occupation _____
3. Position/job title _____
4. Business, field or industry _____

(Record on lines the years in which you have worked in any of these industries, e.g. 1960-1969)

Have you ever worked:	YES	NO
E. In a mine?	_____	_____
F. In a quarry?	_____	_____
G. In a foundry?	_____	_____
H. In a pottery?	_____	_____
I. In a cotton, flax or hemp mill?....	_____	_____
J. With asbestos?	_____	_____

17. PAST MEDICAL HISTORY	YES	NO
A. Do you consider yourself to be in good health?	_____	_____
If "NO" state reason _____		
B. Have you any defect of vision?	_____	_____
If "YES" state nature of defect _____		
C. Have you any hearing defect?	_____	_____
If "YES" state nature of defect _____		

D. Are you suffering from or have you ever suffered from:	YES	NO
a. Epilepsy (or fits, seizures, convulsions)?	_____	_____
b. Rheumatic fever?	_____	_____
c. Kidney disease?	_____	_____
d. Bladder disease?	_____	_____
e. Diabetes?	_____	_____
f. Jaundice?	_____	_____

18. CHEST COLDS AND CHEST ILLNESSES

18A. If you get a cold, does it "usually" go to your chest? (Usually means more than 1/2 the time) — 1. Yes ___ 2. No ___ 3. Don't get colds ___

19A. During the past 3 years, have you had any chest illnesses that have kept you off work, indoors at home, or in bed? — 1. Yes ___ 2. No ___

IF YES TO 19A:

B. Did you produce phlegm with any of these chest illnesses? — 1. Yes ___ 2. No ___ 3. Does Not Apply ___

C. In the last 3 years, how many such illnesses with (increased) phlegm did you have which lasted a week or more? — Number of illnesses ___ No such illnesses ___

20. Did you have any lung trouble before the age of 16? — 1. Yes ___ 2. No ___

21. Have you ever had any of the following?

1A. Attacks of bronchitis? — 1. Yes ___ 2. No ___

IF YES TO 1A:

B. Was it confirmed by a doctor? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

C. At what age was your first attack? Age in Years ___ Does Not Apply ___

2A. Pneumonia (include bronchopneumonia)? 1. Yes ___ 2. No ___

IF YES TO 2A:

B. Was it confirmed by a doctor? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

C. At what age did you first have it? Age in Years ___ Does Not Apply ___

3A. Hay Fever? 1. Yes ___ 2. No ___

IF YES TO 3A:

B. Was it confirmed by a doctor? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

C. At what age did it start? Age in Years ___ Does Not Apply ___

22A. Have you ever had chronic bronchitis? 1. Yes ___ 2. No ___

IF YES TO 22A:

B. Do you still have it? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

C. Was it confirmed by a doctor? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

D. At what age did it start? Age in Years ___ Does Not Apply ___

23A. Have you ever had emphysema? 1. Yes ___ 2. No ___

IF YES TO 23A:

B. Do you still have it? 1. Yes ___ 2. No ___
3. Does Not Apply ___

C. Was it confirmed by a doctor? 1. Yes ___ 2. No ___
3. Does Not Apply ___

D. At what age did it start? Age in Years ___
Does Not Apply ___

24A. Have you ever had asthma? 1. Yes ___ 2. No ___

IF YES TO 24A:

B. Do you still have it? 1. Yes ___ 2. No ___
3. Does Not Apply ___

C. Was it confirmed by a doctor? 1. Yes ___ 2. No ___
3. Does Not Apply ___

D. At what age did it start? Age in Years ___
Does Not Apply ___

E. If you no longer have it, at what age did it stop? Age stopped ___
Does Not Apply ___

25. Have you ever had:

A. Any other chest illness? 1. Yes ___ 2. No ___

If yes, please specify _____

B. Any chest operations? 1. Yes ___ 2. No ___

If yes, please specify _____

C. Any chest injuries? 1. Yes ___ 2. No ___

If yes, please specify _____

26A. Has a doctor ever told 1. Yes ___ 2. No ___

you that you had heart trouble?

IF YES TO 26A:

B. Have you ever had treatment for heart trouble in the past 10 years? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

27A. Has a doctor told you that you had high blood pressure? 1. Yes ___ 2. No ___

IF YES TO 27A:

B. Have you had any treatment for high blood pressure (hypertension) in the past 10 years? 1. Yes ___ 2. No ___ 3. Does Not Apply ___

28. When did you last have your chest X-rayed? (Year) ___ ___ ___ ___

29. Where did you last have your chest X-rayed (if known)? _____

What was the outcome? _____

FAMILY HISTORY

30. Were either of your natural parents ever told by a doctor that they had a chronic lung condition such as:	FATHER			MOTHER		
	1. Yes	2. No	3. Don't know	1. Yes	2. No	3. Don't know
A. Chronic Bronchitis?	___	___	___	___	___	___
B. Emphysema?	___	___	___	___	___	___
C. Asthma?	___	___	___	___	___	___
D. Lung cancer?	___	___	___	___	___	___
E. Other chest conditions?	___	___	___	___	___	___
F. Is parent currently alive?	___	___	___	___	___	___
G. Please Specify	___ Age if Living ___ Age at Death ___ Don't Know			___ Age if Living ___ Age at Death ___ Don't Know		
H. Please specify cause of death	_____			_____		

COUGH

31A. Do you usually have a cough? (Count a cough with first smoke or on first going out of doors. Exclude clearing of throat.) (If no, skip to question 31C.)	1. Yes ___	2. No ___
B. Do you usually cough as much as 4 to 6 times a day 4 or more days out of the week?	1. Yes ___	2. No ___
C. Do you usually cough at all on getting up or first thing in the morning?	1. Yes ___	2. No ___

D. Do you usually cough at all during the rest of the day or at night? 1. Yes ___ 2. No ___

IF YES TO ANY OF ABOVE (31A, B, C, OR D), ANSWER THE FOLLOWING. IF NO TO ALL, CHECK "DOES NOT APPLY" AND SKIP TO NEXT PAGE

E. Do you usually cough like this on most days for 3 consecutive months or more during the year? 1. Yes ___ 2. No ___ 3. Does not apply ___

F. For how many years have you had the cough? Number of years ___ Does not apply ___

32A. Do you usually bring up phlegm from your chest? Count phlegm with the first smoke or on first going out of doors. Exclude phlegm from the nose. Count swallowed phlegm.) (If no, skip to 32C) 1. Yes ___ 2. No ___

B. Do you usually bring up phlegm like this as much as twice a day 4 or more days out of the week? 1. Yes ___ 2. No ___

C. Do you usually bring up phlegm at all on getting up or first thing in the morning? 1. Yes ___ 2. No ___

D. Do you usually bring up phlegm at all on during the rest of the day or at night? 1. Yes ___ 2. No ___

IF YES TO ANY OF THE ABOVE (32A, B, C, OR D), ANSWER THE FOLLOWING:

IF NO TO ALL, CHECK "DOES NOT APPLY" AND SKIP TO 33A

E. Do you bring up phlegm like this on most days for 3 consecutive months or more during the year? 1. Yes ___ 2. No ___ 3. Does not apply ___

F. For how many years have you had trouble with phlegm? Number of years ___ Does not apply ___

EPISODES OF COUGH AND PHLEGM

33A. Have you had periods or episodes of (increased*) cough and phlegm lasting for 3 weeks or more each year?
*(For persons who usually have cough and/or phlegm)
1. Yes ___ 2. No ___

IF YES TO 33A

B. For how long have you had at least 1 such episode per year?
Number of years ___
Does not apply ___

WHEEZING

34A. Does your chest ever sound wheezy or whistling

1. When you have a cold? 1. Yes ___ 2. No ___

2. Occasionally apart from colds? 1. Yes ___ 2. No ___

3. Most days or nights? 1. Yes ___ 2. No ___

B. For how many years has this been present?
Number of years ___
Does not apply ___

35A. Have you ever had an attack of wheezing that has made you feel short of breath? 1. Yes ___ 2. No ___

IF YES TO 35A

B. How old were you when you had your first such attack?
Age in years ___
Does not apply ___

C. Have you had 2 or more such episodes? 1. Yes ___ 2. No ___ 3. Does not apply ___

D. Have you ever required medicine or treatment for the(se) attack(s)? 1. Yes ___ 2. No ___ 3. Does not apply ___

BREATHLESSNESS

36. If disabled from walking by any condition other than heart or lung disease, please describe and proceed to question 38A.	Nature of condition(s) _____ _____
37A. Are you troubled by shortness of breath when hurrying on the level or walking up a slight hill?	1. Yes ___ 2. No ___
IF YES TO 37A	
B. Do you have to walk slower than people of your age on the level because of breathlessness?	1. Yes ___ 2. No ___ 3. Does not apply ___
C. Do you ever have to stop for breath when walking at your own pace on the level?	1. Yes ___ 2. No ___ 3. Does not apply ___
D. Do you ever have to stop for breath after walking about 100 yards (or after a few minutes) on the level?	1. Yes ___ 2. No ___ 3. Does not apply ___
E. Are you too breathless to leave the house or breathless on dressing or climbing one flight of stairs?	1. Yes ___ 2. No ___ 3. Does not apply ___

TOBACCO SMOKING

38A. Have you ever smoked cigarettes? (No means less than 20 packs of cigarettes or 12 oz. of tobacco in a lifetime or less than 1 cigarette a day for 1 year.)	1. Yes ___ 2. No ___
IF YES TO 38A	
B. Do you now smoke cigarettes (as of one month ago)	1. Yes ___ 2. No ___ 3. Does not apply ___

C. How old were you when you first started regular cigarette smoking?	Age in years ___ Does not apply ___
D. If you have stopped smoking cigarettes completely, how old were you when you stopped?	Age stopped ___ Check if still smoking ___ Does not apply ___
E. How many cigarettes do you smoke per day now?	Cigarettes per day ___ Does not apply ___
F. On the average of the entire time you smoked, how many cigarettes did you smoke per day?	Cigarettes per day ___ Does not apply ___
G. Do or did you inhale the cigarette smoke?	1. Does not apply ___ 2. Not at all ___ 3. Slightly ___ 4. Moderately ___ 5. Deeply ___
39A. Have you ever smoked a pipe regularly? (Yes means more than 12 oz. of tobacco in a lifetime.)	1. Yes ___ 2. No ___

IF YES TO 39A
FOR PERSONS WHO HAVE EVER SMOKED A PIPE

B. 1. How old were you when you started to smoke a pipe regularly?	Age ___
2. If you have stopped smoking a pipe completely, how old were you when you stopped?	Age stopped ___ Check if still smoking pipe ___ Does not apply ___

C. On the average over the entire time you smoked a pipe, how much pipe tobacco did you smoke per week?	___ oz. per week (a standard pouch of tobacco contains 1 1/2 oz.) ___ Does not apply
D. How much pipe tobacco are you smoking now?	oz. per week ___ Not currently smoking a pipe ___
E. Do you or did you inhale the pipe smoke?	1. Never smoked ___ 2. Not at all ___ 3. Slightly ___ 4. Moderately ___ 5. Deeply ___

40A. Have you ever smoked cigars regularly? 1. Yes ___ 2. No ___

(Yes means more than 1 cigar a week for a year)

IF YES TO 40A

FOR PERSONS WHO HAVE EVER SMOKED A CIGAR

B. 1. How old were you when you started smoking cigars regularly?	Age ___
2. If you have stopped smoking cigars completely, how old were you when you stopped smoking cigars?	Age stopped ___ Check if still ___ Does not apply ___
C. On the average over the entire time you smoked cigars, how many cigars did you smoke per week?	Cigars per week ___ Does not apply ___
D. How many cigars are you smoking per week now?	Cigars per week ___ Check if not smoking cigars currently ___

E. Do or did you inhale the cigar smoke?	1. Never smoked ___ 2. Not at all ___ 3. Slightly ___ 4. Moderately ___ 5. Deeply ___

Signature _____ Date _____

Part 2

PERIODIC MEDICAL QUESTIONNAIRE

1. NAME_____

2. CLOCK NUMBER ___ ___ ___ ___ ___ ___ ___

3. PRESENT OCCUPATION_____

4. PLANT _____

5. ADDRESS _____

6. _____
(Zip Code)

7. TELEPHONE NUMBER _____

8. INTERVIEWER _____

9. DATE _____

10. What is your marital status? 1. Single ___ 2. Married ___ 3. Widowed ___ 4. Separated/ Divorced ___

11. OCCUPATIONAL HISTORY

11A. In the past year, did you work full time (30 hours per week or more) for 6 months or more? 1. Yes ___ 2. No ___

IF YES TO 11A:

11B. In the past year, did you work in a dusty job? 1. Yes ___ 2. No ___ 3. Does not Apply ___

11C. Was dust exposure: 1. Mild ___ 2. Moderate ___ 3. Severe ___

11D. In the past year, were you exposed to gas or chemical fumes in your work? 1. Yes ___ 2. No ___

11E. Was exposure: 1. Mild ___ 2. Moderate ___ 3. Severe ___

11F. In the past year, what was your:
1. Job/occupation? _____
2. Position/job title? _____

12. RECENT MEDICAL HISTORY

12A. Do you consider yourself to be in good health? Yes ___ No ___

If NO, state reason _____

12B. In the past year, have you developed:

	Yes	No
Epilepsy?	___	___
Rheumatic fever?	___	___
Kidney disease?	___	___
Bladder disease?	___	___
Diabetes?	___	___
Jaundice?	___	___
Cancer?	___	___

13. CHEST COLDS AND CHEST ILLNESSES

13A. If you get a cold, does it "usually" go to your chest? (usually means more than 1/2 the time)
1. Yes ___ 2. No ___
3. Don't get colds ___

14A. During the past year, have you had any chest illnesses that have kept you off work, indoors at home, or in bed?
1. Yes ___ 2. No ___
3. Does Not Apply ___

IF YES TO 14A:

14B. Did you produce phlegm with any of these chest illnesses?
1. Yes ___ 2. No ___
3. Does Not Apply ___

14C. In the past year, how many such illnesses with (increased) phlegm did you have which lasted a week or more?
Number of illnesses ___
No such illnesses ___

15. RESPIRATORY SYSTEM

In the past year have you had:

	Yes or No	Further Comment on Positive Answers
Asthma	_____	
Bronchitis	_____	
Hay Fever	_____	
Other Allergies	_____	

	Yes or No	Further Comment on Positive Answers
Pneumonia	_____	
Tuberculosis	_____	
Chest Surgery	_____	
Other Lung Problems	_____	
Heart Disease	_____	

Do you have:

	Yes or No	Further Comment on Positive Answers
Frequent colds	_____	
Chronic cough	_____	
Shortness of breath when walking or climbing one flight or stairs	_____	

Do you:

Wheeze	_____	
Cough up phlegm	_____	
Smoke cigarettes	_____	Packs per day ____ How many years ___

Date _____ Signature _____

Appendix E to § 1926.1101—Classification of Chest X-Rays—Mandatory

(a) Chest X-rays shall be classified in accordance with the Guidelines for the use of the ILO International Classification of Radiographs of Pneumoconioses (revised edition 2011) (incorporated by reference, see § 1926.6), and recorded on a classification form following the format of the CDC/NIOSH (M) 2.8 form. As a minimum, the content within the bold lines of this form (items 1 through 4) shall be included. This form is not to be submitted to NIOSH.

(b) All X-rays shall be classified only by a B-Reader, a board eligible/certified radiologist, or an experienced physician with known expertise in pneumoconioses.

(c) Whenever classifying chest X-ray film, the physician shall have immediately available for reference a complete set of the ILO standard format radiographs provided for use with the Guidelines for the use of the ILO International Classification of Radiographs of Pneumoconioses (revised edition 2011).

(d) Whenever classifying digitally-acquired chest X-rays, the physician shall have immediately available for reference a complete set of ILO standard digital chest radiographic images provided for use with the Guidelines for the Use of the ILO International Classification of Radiographs of Pneumoconioses (revised edition 2011). Classification of digitally-acquired chest X-rays shall be based on the viewing of images displayed as electronic copies and shall not be based on the viewing of hard copy printed transparencies of images.

* * * * *

Appendix I to § 1926.1101—Medical Surveillance Guidelines for Asbestos, Non-Mandatory

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III. Signs and Symptoms of Exposure-Related Disease

The signs and symptoms of lung cancer or gastrointestinal cancer induced by exposure to asbestos are not unique, except that a chest X-ray of an exposed patient with lung cancer may show pleural plaques, pleural calcification, or pleural fibrosis, and may also show asbestosis (*i.e.,* small irregular parenchymal opacities). Symptoms characteristic of mesothelioma include shortness of breath, pain in the chest or abdominal pain. Mesothelioma has a much longer average latency period compared with lung cancer (40 years versus 15–20 years), and mesothelioma is therefore more likely to be found among workers who were first exposed to asbestos at an early age. Mesothelioma is a fatal disease.

Asbestosis is pulmonary fibrosis caused by the accumulation of asbestos fibers in the lungs. Symptoms include shortness of breath, coughing, fatigue, and vague feelings of sickness. When the fibrosis worsens, shortness of breath occurs even at rest. The diagnosis of asbestosis is most commonly based on a history of exposure to asbestos, the presence of characteristic radiologic abnormalities, end-inspiratory crackles (rales), and other clinical features of fibrosing lung disease. Pleural plaques and thickening may be observed on chest X-rays. Asbestosis is often a progressive disease even in the absence of continued exposure, although this appears to be a highly individualized characteristic. In severe cases, death may be caused by respiratory or cardiac failure.

IV. Surveillance and Preventive Considerations

As noted in section III of this appendix, exposure to asbestos has been linked to an increased risk of lung cancer, mesothelioma, gastrointestinal cancer, and asbestosis among occupationally exposed workers. Adequate screening tests to determine an employee's potential for developing serious chronic diseases, such as a cancer, from exposure to asbestos do not presently exist. However, some tests, particularly chest X-rays and pulmonary function tests, may indicate that an employee has been overexposed to asbestos increasing his or her risk of developing exposure related chronic diseases. It is important for the physician to become familiar with the operating conditions in which occupational exposure to asbestos is likely to occur. This is particularly important in evaluating medical and work histories and in conducting physical examinations. When an active employee has been identified as having been overexposed to asbestos measures taken by the employer to eliminate or mitigate further exposure should also lower the risk of serious long-term consequences.

The employer is required to institute a medical surveillance program for all employees who are or will be exposed to asbestos at or above the permissible exposure limit (0.1 fiber per cubic centimeter of air). All examinations and procedures must be performed by or under the supervision of a licensed physician, at a reasonable time and place, and at no cost to the employee.

Although broad latitude is given to the physician in prescribing specific tests to be included in the medical surveillance program, OSHA requires inclusion of the following elements in the routine examination:

(i) Medical and work histories with special emphasis directed to symptoms of the respiratory system, cardiovascular system, and digestive tract.

(ii) Completion of the respiratory disease questionnaire contained in appendix D of this appendix.

(iii) A physical examination including a chest X-ray and pulmonary function test that includes measurement of the employee's forced vital capacity (FVC) and forced expiratory volume at one second (FEV_1).

(iv) Any laboratory or other test that the examining physician deems by sound medical practice to be necessary.

The employer is required to make the prescribed tests available at least annually to those employees covered; more often than specified if recommended by the examining physician; and upon termination of employment.

The employer is required to provide the physician with the following information: A copy of the standard in this section (including all appendices to this section); a description of the employee's duties as they relate to asbestos exposure; the employee's representative level of exposure to asbestos; a description of any personal protective and respiratory equipment used; and information from previous medical examinations of the affected employee that is not otherwise available to the physician. Making this information available to the physician will aid in the evaluation of the employee's health in relation to assigned duties and fitness to wear personal protective equipment, if required.

The employer is required to obtain a written opinion from the examining physician containing the results of the medical examination; the physician's opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of exposure-related disease; any recommended limitations on the employee or on the use of personal protective equipment; and a statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions related to asbestos exposure that require further explanation or treatment. This written opinion must not reveal specific findings or diagnoses unrelated to exposure to asbestos, and a copy of the opinion must be provided to the affected employee.

* * * * *

■ 44. Revise paragraph (l)(4)(ii)(C) of § 1926.1127 to read as follows:

§ 1926.1127 Cadmium.

* * * * *

(l) * * *

(4) * * *

(ii) * * *

(C) A 14 inch by 17 inch or other reasonably-sized standard film or digital posterior-anterior chest X-ray (after the initial X-ray, the frequency of chest X-rays is to be determined by the examining physician);

* * * * *

§ 1926.1129 [Removed and Reserved]

■ 45. Remove and reserve § 1926.1129.

§§ 1910.120, 1910.1001, 1910.1017, 1910.1018, 1910.1025, 1910.1026, 1910.1027, 1910.1028, 1910.1029, 1910.1030, 1910.1043, 1910.1044, 1910.1045, 1910.1047, 1910.1048, 1910.1050, 1910.1051, 1910.1052, 1910.1053, 1915.1001, 1915.1026, 1926.60, 1926.62, 1926.65, 1926.1101, 1926.1126, 1926.1127, and 1926.1153 [Amended]

■ 46. In addition to the amendments set forth above, in 29 CFR parts 1910, 1915, and 1926, remove words and punctuation from the following sections as follows:

Words and punctuation to remove	29 CFR		
	Part 1910	Part 1915	Part 1926
and social security number.	1910.120(f)(8)(ii)(A), 1910.1001(m)(3)(ii)(A), 1910.1017(m)(1), 1910.1025(d)(5), 1910.1025(n)(3)(ii)(A), 1910.1025, app. B, Sec. XII., 1910.1026(m)(4)(ii)(A), 1910.1028(k)(2)(ii)(A), 1910.1030(h)(1)(ii)(A), 1910.1043(k)(2)(ii)(A), 1910.1044(p)(2)(ii)(*a*), 1910.1047(k)(3)(ii)(A), 1910.1048(o)(3)(i), 1910.1048(o)(4)(ii)(D), 1910.1050(n)(5)(ii)(A), 1910.1051(m)(4)(ii)(A), 1910.1053(k)(3)(ii)(A).	1915.1001(n)(3)(ii)(A), 1915.1026(k)(4)(ii)(A).	1926.60(o)(5)(ii)(A), 1926.62(d)(5), 1926.62(n)(3)(ii)(A), 1926.62, app. B, Sec. XII., 1926.65(f)(8)(ii)(A), 1926.1101(n)(3)(ii)(A), 1926.1126(k)(4)(ii)(A), 1926.1127(d)(2)(iv), 1926.1153(j)(3)(ii)(A).
social security numbers,.	1910.1043(k)(1)(ii)(C), 1910.1048(o)(1)(vi).	.....	
social security number,.	1910.1028(k)(1)(ii)(D), 1910.1050(n)(3)(ii)(D), 1910.1052(m)(2)(ii)(F), 1910.1052(m)(2)(iii)(C).	.....	
, social security number.	1910.1001(m)(1)(ii)(F), 1910.1047(k)(2)(ii)(F), 1910.1050(n)(4)(ii)(A), 1910.1051(m)(2)(ii)(F), 1910.1052(m)(3)(ii)(A).	.....	
, social security number,.	1910.1018(q)(1)(ii)(D), 1910.1018(q)(2)(ii)(A), 1910.1025(n)(1)(ii)(D), 1910.1025(n)(2)(ii)(A), 1910.1026(m)(1)(ii)(F), 1910.1027(n)(1)(ii)(B), 1910.1027(n)(3)(ii)(A), 1910.1029(m)(1)(i)(*a*), 1910.1029(m)(2)(i)(*a*), 1910.1044(p)(1)(ii)(*d*), 1910.1045(q)(2)(ii)(D), 1910.1053(k)(1)(ii)(G).	1915.1001(n)(2)(ii)(F), 1915.1026(k)(1)(ii)(F).	1926.60(o)(4)(ii)(F), 1926.62(n)(1)(ii)(D), 1926.62(n)(2)(ii)(A), 1926.1101(n)(2)(ii)(F), 1926.1126(k)(1)(ii)(F), 1926.1127(n)(1)(ii)(B), 1926.1127(n)(3)(ii)(A), 1926.1153(j)(1)(ii)(G).

[FR Doc. 2019–07902 Filed 5–13–19; 8:45 am]

BILLING CODE 4510–26–P