

Ionizing Radiation Standard (29 CFR 1926.1096)  
1218-0103  
October 2017

**SUPPORTING STATEMENT FOR THE  
INFORMATION COLLECTION REQUIREMENTS OF THE  
IONIZING RADIATION STANDARD (29 CFR 1910.1096)<sup>1</sup>  
(OFFICE OF MANAGEMENT AND BUDGET (OMB)  
CONTROL NO. 1218-0103 (October 2017))**

**A. JUSTIFICATION**

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

The Occupational Safety and Health Act's (OSH Act) main objective 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). To achieve this objective, the OSH Act specifically authorizes "the development and promulgation of occupational safety and health standards" (29 U.S.C. 651).

For health standards, including standards addressing harmful physical agents such as ionizing radiation, the OSH Act contains specific statutory language. As appropriate, health standards must include provisions for monitoring and measuring worker exposure, medical examinations and other tests, control and technological procedures, suitable protective equipment, and labels and other appropriate forms of warning, and precautions for safe use or exposure (29 U.S.C. 655 and 657). In addition, the OSH Act mandates "regulations requiring employers to maintain accurate records of worker exposures to potentially toxic materials or other harmful physical agents which are required to be monitored and measured," and further requires that employers notify workers exposed to concentrations over specific limits of these exposures, and of the corrective action they are taking (29 U.S.C. 657).

Under the authority granted by the OSH Act, the Occupational Safety and Health Administration ("OSHA" or "Agency") published a health standard governing worker exposure to ionizing radiation, 29 CFR 1910.1096 (the "Standard"). The purpose of this Standard is to reduce the incidence of adverse health effects such as tissue damage and cancer among workers exposed to ionizing radiation. Ionizing radiation is defined as radiation that includes alpha particles, beta particles, gamma rays, X-rays, neutrons, high-speed electrons, high-speed protons, and other

---

<sup>1</sup>The purpose of this Supporting Statement is to analyze and describe the burden hours and costs associated with provisions of the standard that contain paperwork requirements, and does not provide information, advice, or guidance on how to comply with or to enforce the Standard.

atomic particles.<sup>2</sup> Items 2 and 12 below describe the specific information collection requirements of the Standard.

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

The following are the information collection requirements as stated in the Standard, followed by discussions indicating how, by whom, and for what purpose the information is used for each of these requirements.

#### **A. Precautionary procedures and personal monitoring (§1910.1096(d))**

§1910.1096(d)(2) - Every employer shall supply appropriate personnel monitoring equipment,<sup>3</sup> such as film badges, pocket chambers, pocket dosimeters, or film rings, and shall require the use of such equipment by:

§1910.1096(d)(2)(i) - Each employee who enters a restricted area under such circumstances that he receives, or is likely to receive, a dose in any calendar quarter in excess of 25 percent of the applicable value specified in paragraph (b)(1) of this section; and

§1910.1096(d)(2)(ii) - Each employee under 18 years of age who enters a restricted area<sup>4</sup> under such circumstances that he receives, or is likely to receive, a dose in any calendar quarter in excess of 5 percent of the applicable value specified in paragraph (b)(1) of this section; and

§1910.1096(d)(2)(iii) - Each employee who enters a high radiation area.<sup>5</sup>

---

<sup>2</sup>The term “radiation” does not include sound or radio waves, or visible, infrared, or ultraviolet light. (See paragraph (a)(1) of the Standard.)

<sup>3</sup> <sup>?</sup> “*Personnel monitoring equipment*” means devices designed to be worn or carried by an individual for the purpose of measuring the dose received (e.g., film badges, pocket chambers, pocket dosimeters, film rings, etc.).

<sup>4</sup>A “restricted area,” according to paragraph (a)(3) of the Standard means “any area access to which is controlled by the employer for the purposes of protection of individuals from exposure to radiation or radioactive materials.”

<sup>5</sup> <sup>?</sup> “*High radiation area*” means any area, accessible to personnel, in which there exists radiation at such levels that a major portion of the body could receive in any one hour a dose in excess of 100 millirem.

**Purpose:** This information alerts employers if workers are receiving overexposures to ionizing radiation, and enables them to take the corrective action(s) necessary to reduce ionizing-radiation exposure. In addition, these measurements remind employers and workers of the continuing need to protect against the hazards that could result from overexposure to ionizing radiation.

**B. Caution signs, labels, and signals (§1910.1096(e))** -- No burden hours will be taken.

**Radiation area (§1910.1096(e)(2))** - Each radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol described in subparagraph (1) of this paragraph and the words:

**CAUTION**

**RADIATION AREA**

**High radiation area (§1910.1096(e)(3))**

§1910.1096(e)(3)(i) - Each high radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

**CAUTION**

**HIGH RADIATION AREA**

**Airborne radioactivity area (§1910.1096(e)(4))**

§1910.1096(e)(4)(ii) - Each airborne radioactivity area<sup>6</sup> shall be conspicuously posted with a sign or signs bearing the radiation caution symbol described in paragraph (e)(1) of this section and the words:

**CAUTION**

**AIRBORNE RADIOACTIVITY AREA**

---

<sup>6</sup> “Airborne radioactivity area” means: §1910.1096(e)(4)(i)(a) Any room, enclosure, or operating area in which airborne radioactive materials, composed wholly or partly of radioactive material, exist in concentrations in excess of the amounts specified in column 1 of Table 1 of appendix B to 10 CFR part 20; or §1910.1096(e)(4)(i)(b) Any room, enclosure, or operating area in which airborne radioactive materials exist in concentrations which, averaged over the number of hours in any week during which individuals are in the area, exceed 25 percent of the amounts specified in column 1 of Table 1 of appendix B to 10 CFR part 20.

***Additional requirements (§1910.1096(e)(5))***

§1910.1096(e)(5)(i) - Each area or room in which radioactive material is used or stored and which contains any radioactive material (other than natural uranium or thorium) in any amount exceeding 10 times the quantity of such material specified in appendix C to 10 CFR part 20 shall be conspicuously posted with a sign or signs bearing the radiation caution symbol described in paragraph (e)(1) of this section and the words:

**CAUTION**

**RADIOACTIVE MATERIALS**

§1910.1096(e)(5)(ii) - Each area or room in which natural uranium or thorium is used or stored in an amount exceeding 100 times the quantity of such material specified in 10 CFR part 20 shall be conspicuously posted with a sign or signs bearing the radiation caution symbol described in paragraph (e)(1) of this section and the words:

**CAUTION**

**RADIOACTIVE MATERIALS**

***Containers (§1910.1096(e)(6))***

§1910.1096(e)(6)(i) - Each container in which is transported, stored, or used a quantity of any radioactive material (other than natural uranium or thorium) greater than the quantity of such material specified in appendix C to 10 CFR part 20 shall bear a durable, clearly visible label bearing the radiation caution symbol described in paragraph (e)(1) of this section and the words:

**CAUTION**

**RADIOACTIVE MATERIALS**

§1910.1096(e)(6)(ii) - Each container in which natural uranium or thorium is transported, stored, or used in a quantity greater than 10 times the quantity specified in appendix C to 10 CFR part 20 shall bear a durable, clearly visible label bearing the radiation caution symbol described in paragraph (e)(1) of this section and the words:

**CAUTION**

**RADIOACTIVE MATERIALS**

§1910.1096(e)(6)(iii) - Notwithstanding the provisions of paragraphs (e)(6)(i) and (ii) of this section a label shall not be required:

§1910.1096(e)(6)(iii)(a) - If the concentration of the material in the container does not exceed that specified in column 2 of Table 1 of appendix B to 10 CFR part 20, or;

§1910.1096(e)(6)(iii)(b) - For laboratory containers, such as beakers, flasks, and test tubes, used transiently in laboratory procedures, when the user is present.

§1910.1096(e)(6)(iv) - Where containers are used for storage, the labels required in this subparagraph shall state also the quantities and kinds of radioactive materials in the containers and the date of measurement of the quantities.

These provisions specify the locations at which employers must post caution signs, and the requirements for labeling containers in which employers transport, store, or use radioactive materials. The Standard provides the specific language for the required signs and labels. Employers are not required to collect information to put on caution signs and labels, therefore, OSHA took no burden hours or costs for these provisions. (See 5 CFR 1320.3(c)(2)).

**Purpose:** Both caution signs and labels provide workers with information that is usable, readily accessible, and in a concise form. Caution signs serve to warn workers that they are in or near a radiation or high-radiation area, and supplements the hazard training workers receive under the Standard. Caution labels also inform workers of the locations of ionizing radiation, and that they may need to implement special precautions to prevent exposure to ionizing radiation.

**C. Exceptions from posting requirements (§1910.1096(g))** – No burden hours will be taken.

Notwithstanding the provisions of paragraph (e) of this section:

§1910.1096(g)(1) - A room or area is not required to be posted with a caution sign because of the presence of a sealed source, provided the radiation level 12 inches from the surface of the source container or housing does not exceed 5 millirem per hour.

§1910.1096(g)(2) - Rooms or other areas in onsite medical facilities are not required to be posted with caution signs because of the presence of patients containing radioactive material, provided that there are personnel in attendance who shall take the precautions necessary to prevent the exposure of any individual to radiation or radioactive material in excess of the limits established in the provisions of this section.

§1910.1096(g)(3) - Caution signs are not required to be posted at areas or rooms containing radioactive materials for periods of less than 8 hours: *Provided, That*

Ionizing Radiation Standard (29 CFR 1926.1096)  
1218-0103  
October 2017

*§1910.1096(g)(3)(i)* - The materials are constantly attended during such periods by an individual who shall take the precautions necessary to prevent the exposure of any individual to radiation or radioactive materials in excess of the limits established in the provisions of this section; and

*§1910.1096(g)(3)(ii)* - Such area or room is subject to the employer's control.

**D. Exemptions for radioactive materials packaged for shipment (§1910.1096(h))** No burden hours will be taken.

Radioactive materials packaged and labeled in accordance with regulations of the Department of Transportation published in 49 CFR Chapter I, are exempt from the labeling and posting requirements of this subpart during shipment, provided that the inside containers are labeled in accordance with the provisions of paragraph (e) of this section.

**E. Instruction of personnel, posting (§1910.1096(i))**

*§1910.1096(i)(1)* - Employers regulated by the Nuclear Regulatory Commission shall be governed by 10 CFR part 20 standards. Employers in a State named in paragraph (p)(3) of this section shall be governed by the requirements of the laws and regulations of that State. All other employers shall be regulated by the following:

*§1910.1096(i)(2)* - All individuals working in or frequenting any portion of a radiation area shall be informed of the occurrence of radioactive materials or of radiation in such portions of the radiation area; shall be instructed in the safety problems associated with exposure to such materials or radiation and in precautions or devices to minimize exposure; shall be instructed in the applicable provisions of this section for the protection of employees from exposure to radiation or radioactive materials; and shall be advised of reports of radiation exposure which employees may request pursuant to the regulations in this section.

*§1910.1096(i)(3)* - Each employer to whom this section applies shall post a current copy of its provisions and a copy of the operating procedures applicable to the work conspicuously in such locations as to insure that employees working in or frequenting radiation areas will observe these documents on the way to and from their place of employment, or shall keep such documents available for examination of employees upon request.

Note: The requirement that employers provide training to workers under paragraph (i)(2) is not considered to be a collection of information. Therefore, OSHA does not take burden for this activity under Item 12 of this Supporting Statement.

Ionizing Radiation Standard (29 CFR 1926.1096)  
1218-0103  
October 2017

**Purpose:** Posting the Standard and operating procedures so they are conspicuous to workers entering and leaving radiation areas acts to daily reinforce the instruction and information workers have received.

#### **F. Notification of incidents (§1910.1096(l))**

**Immediate notification (§1910.1096(l)(1))** - Each employer shall immediately notify the Assistant Secretary of Labor or his duly authorized representative, for employees not protected by the Nuclear Regulatory Commission by means of 10 CFR part 20; paragraph (p)(2) of this section, or the requirements of the laws and regulations of States named in paragraph (p)(3) of this section, by telephone or telegraph of any incident involving radiation which may have caused or threatens to cause:

*§1910.1096(l)(1)(i)* - Exposure of the whole body of any individual to 25 rems or more of radiation; exposure of the skin of the whole body of any individual to 150 rems or more of radiation; or exposure of the feet, ankles, hands, or forearms of any individual to 375 rems or more of radiation; or

*§1910.1096(l)(1)(ii)* - The release of radioactive material in concentrations which, if averaged over a period of 24 hours, would exceed 5,000 times the limit specified for such materials in Table II of appendix B to 10 CFR part 20.

**Twenty-four hour notification (§1910.1096(l)(2))** - Each employer shall within 24 hours following its occurrence notify the Assistant Secretary of Labor or his duly authorized representative for employees not protected by the Nuclear Regulatory Commission by means of 10 CFR part 20; paragraph (p)(2) of this section, or the requirements of the laws and applicable regulations of States named in paragraph (p)(3) of this section, by telephone or telegraph of any incident involving radiation which may have caused or threatens to cause:

*§1910.1096(l)(2)(i)* - Exposure of the whole body of any individual to 5 rems or more of radiation; exposure of the skin of the whole body of any individual to 30 rems or more of radiation; or exposure of the feet, ankles, hands, or forearms to 75 rems or more of radiation.

**Purpose:** Allows area offices the opportunity to determine if a site visit is needed. Workers overexposed to ionizing radiation may develop adverse health effects, such as cancer and tissue damage.

#### **G. Reports of overexposure and excessive levels and concentrations (§1910.1096(m))**

Ionizing Radiation Standard (29 CFR 1926.1096)  
1218-0103  
October 2017

*§1910.1096(m)(1)* - In addition to any notification required by paragraph (1) of this section each employer shall make a report in writing within 30 days to the Assistant Secretary of Labor or his duly authorized representative, for employees not protected by the Nuclear Regulatory Commission by means of 10 CFR part 20; or under paragraph (p)(2) of this section, or the requirements of the laws and regulations of States named in paragraph (p)(3) of this section, of each exposure of an individual to radiation or concentrations of radioactive material in excess of any applicable limit in this section. Each report required under this paragraph shall describe the extent of exposure of persons to radiation or to radioactive material; levels of radiation and concentration of radioactive material involved, the cause of the exposure, levels of concentrations; and corrective steps taken or planned to assure against a recurrence.

*§1910.1096(m)(2)* - In any case where an employer is required pursuant to the provisions of this paragraph to report to the U.S. Department of Labor any exposure of an individual to radiation or to concentrations of radioactive material, the employer shall also notify such individual of the nature and extent of exposure. Such notice shall be in writing and shall contain the following statement:

**"You should preserve this report for future reference."**

**Purpose:** These reports will provide necessary follow-up to determine if employers are taking the necessary corrective steps.



## **H. Records (§1910.1096(n))**

*§1910.1096(n)(1)* - Every employer shall maintain records of the radiation exposure of all employees for whom personnel monitoring is required under paragraph (d) of this section and advise each of his employees of his individual exposure on at least an annual basis.

*§1910.1096(n)(2)* - Every employer shall maintain records in the same units used in tables in paragraph (b) of this section and appendix B to 10 CFR part 20.

**Purpose:** Exposure records are maintained principally to protect worker health, to assist in the prevention or early diagnosis of adverse health effects associated with ionizing radiation exposure, and to provide valuable information to both workers and employers about the effectiveness of methods used to control exposure to ionizing radiation. The records also assist OSHA in enforcing the Standard.

## **I. Disclosure to former employee of individual employee's record (§1910.1096(o))**

*§1910.1096(o)(1)* - At the request of a former employee an employer shall furnish to the employee a report of the employee's exposure to radiation as shown in records maintained by the employer pursuant to paragraph (n)(1) of this section. Such report shall be furnished within 30 days from the time the request is made, and shall cover each calendar quarter of the individual's employment involving exposure to radiation or such lesser period as may be requested by the employee. The report shall also include the results of any calculations and analysis of radioactive material deposited in the body of the employee. The report shall be in writing and contain the following statement:

**"You should preserve this report for future reference."**

**Purpose:** Based on the information they receive under paragraphs (n)(1) and (o) of the Standard, workers can determine the need for medical treatment or other interventions as a result of their exposure to ionizing radiation. Former workers, especially, may use this information to assess the probability of developing latent diseases caused by their exposure to ionizing radiation.

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

Employers may use improved information technology when making, keeping, and preserving the required records. OSHA wrote the paperwork requirements of the Standard in performance-oriented language, i.e., in terms of what information to collect, not how to collect it.

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

OSHA's regulatory authority under the Standard extends to employers who have ionizing-radiation hazards in their workplaces, unless such hazards are subject to regulation by the Nuclear Regulatory Commission (NRC), the Mine Safety and Health Administration, any other federal regulatory agency that exercises authority over ionizing-radiation exposures, or by an employer registered with or licensed by a state specified in paragraph (p)(3) of the Standard. In general, OSHA's authority to regulate ionizing radiation hazards includes x-ray equipment, some accelerators, incidental accelerator-produced radioactive materials, electron microscopes, electron beams, betatrons, ion implanters, and some naturally occurring radioactive materials. The information collection requirements of the Standard are specific to each employer; these employers do not record, maintain, or report this information to the NRC or any other federal or state agency. Therefore, OSHA does not require these employers to duplicate these information collection activities (i.e., the required information is available only from these employers).

**5. If the collection of information impacts small businesses or other small entities, describe any methods used to minimize burden.**

The information collection requirements of the Standard do not have a significant impact on a substantial number of small entities.

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

The information collection frequencies specified by the Standard are the minimum frequencies necessary to ensure that employers and OSHA can effectively monitor the exposure and health status of workers exposed to ionizing radiation.

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

- **requiring respondents to report information to the Agency more often than quarterly;**
- **requiring respondents to prepare a written response to a collection of information in fewer than 30 days after receipt of it;**
- **requiring respondents to submit more than an original and two copies of any document;**
- **requiring respondents to retain records, other than health, medical, government contract, grant-in-aid, or tax records for more than three years;**

- **in connection with a statistical survey, that is not designed to produce valid and reliable results that can be generalized to the universe of study;**
- **requiring the use of a statistical data classification that has not been reviewed and approved by OMB;**
- **that includes a pledge of confidentiality that is not supported by authority established in statute or regulation, that is not supported by disclosure and data security policies that are consistent with the pledge, or which unnecessarily impedes sharing of data with other agencies for compatible confidential use; or**
- **requiring respondents to submit proprietary trade secret, or other confidential information unless the Agency can demonstrate that it has instituted procedures to protect the information's confidentiality to the extent permitted by law.**

The Standard requires notification of OSHA immediately or within 24 hours when certain overexposure incidents occur. Paragraph (l)(1) of the Standard requires employers to immediately notify OSHA by telephone of any incident that causes, or may cause, a worker to receive radiation exposure of the: whole body at or above 25 rems; skin of the whole body at or above 150 rems; feet, ankles, hands, or forearms at or above 375 rems. The Standard also requires immediate notification if a release of radioactive material occurs in which the concentrations of the material, averaged over a 24-hour period, exceeds 5,000 times the limit specified for the material in Table II of appendix B to 10 CFR part 20. In addition, paragraph (l)(2) of the Standard mandates that employers notify OSHA, by telephone, within 24 hours of any incident that causes, or may cause, a worker to receive radiation exposure of the: Whole body at or above 5 rems; skin over the whole body at or above 30 rems; or feet, ankles, hands, or forearms at or above 75 rems.

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

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

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

As required by the Paperwork Reduction Act of 1995 (44 U.S.C. 3506(c)(2)(A)), OSHA published a notice in the Federal Register on August 8, 2017 (82 FR 37117, Docket No. OSHA-

Ionizing Radiation Standard (29 CFR 1926.1096)  
1218-0103  
October 2017

2010-0030) soliciting public comments on its proposal to extend the Office of Management and Budget's (OMB) approval of the information collection requirements specified by the Standard on Ionizing Radiation (29 CFR 1910.1096). This notice was part of a preclearance consultation program that provides the general public and government agencies with an opportunity to comment on OSHA's request for an extension by OMB of a previous approval of the information collection requirements found in the Standard. The Agency received no comments in response to the Federal Register notice.

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

The Agency will not provide payments or gifts to the respondents.

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

Since medical records contain information that may be considered private, OSHA has taken steps to ensure that the data are kept private to the extent allowed by law. Rules of Agency practice and procedure governing OSHA access to worker medical records are contained in 29 CFR 1913.10. The legal authority for these procedural regulations is found in sections 8(c)(1) and 8(g)(2) of the Occupational Safety and Health Act, 29 U.S.C. 657.

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

None of the provisions in the Standard requires an employer to collect sensitive information.

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

- **Indicate the number of respondents, frequency of response, annual hour burden, and an explanation of how the burden was estimated. Unless directed to do so, agencies should not conduct special surveys to obtain information on which to base hour burden estimates. Consultation with a sample (fewer than 10) of potential respondents is desirable. If the hour burden on respondents is expected to vary widely because of differences in activity, size, or complexity, show the range of estimated hour burden, and explain the reasons for the variance. Generally, estimates should not include burden hours for customary and usual business practices.**
- **If this request for approval covers more than one form, provide separate hour burden estimates for each form.**

- **Provide estimates of annualized cost to respondents for the hour burdens for information collection requirements, identifying and using appropriate wage rate categories. The cost of contracting out or paying outside parties for information collection activities should not be included here. Instead, this cost should be included in Item 14.**

To calculate burden hours and costs, OSHA estimates that 968,279 establishments may use ionizing radiation.<sup>7</sup> Industries that the Agency believes may have ionizing-radiation exposures are: Oil and gas; industrial waste-water treatment; municipal drinking water; geothermal energy; agriculture and food processing; wood, pulp, and paper; polymers, rubber, and synthetics; semiconductor, electronic, and ceramic; medical, dental, and veterinary; coal-fired power plants; shipbuilding and offshore installations; aviation and aerospace; foundries and rolling mills; transportation; and research. Table 1 below shows the estimated number of facilities in each of these industries and the typical sources of their ionizing-radiation exposures.

**Table 1**

**Number of Facilities per Industry and Typical Sources of Ionizing Radiation Exposures**

<b>Industry</b>	<b>No. of Facilities</b>	<b>Typical IR Sources</b>
Oil and gas (well logging)	18,623	NORM or TENORM <sup>8</sup>
Industrial waste-water treatment	5,301	Electron beam
Municipal drinking water	4,378	NORM
Geothermal energy	94	TENORM
Agriculture and food processing	10,313	Electron beam or X-ray
Wood, pulp, and paper	4,692	X-ray
Polymers, rubber, and synthetics	17,245	Electron beam
	26,257	

<sup>7</sup> The Agency used U.S. Census Bureau County Business Patterns data from 2015 for specific NAICS codes which correspond to establishment data and codes found in the report prepared by Advanced Technologies and Laboratories International, Inc. titled “Background Information Report for an Occupational Ionizing Radiation Protection Standard,” vol. 6, September 2000. In addition, after further review of the 2000 report, the Agency has added three new industry categories to the Table: Sterilization and Bio-burden Reduction, Phosphate Manufacturing, and Construction..

<sup>8</sup>NORM refers to “naturally-occurring radioactive material,” and TENORM designates to “technologically-enhanced, naturally-occurring radioactive material.”

Industry	No. of Facilities	Typical IR Sources
Semiconductor, electronic, and ceramics		X-ray
Medical	100,887	X-ray and electron beam
Dental	78,751	
Veterinary	6,885	
Coal-fired power plants	1,663	NORM
Shipbuilding and offshore installations	7,967	X-ray
Aviation and aerospace	2,731	X-ray
Foundries and rolling mills	21,884	X-ray
Research	11,916	Accelerators, dosimetry instruments, and electron microscopes
Transportation	55,588	X-Ray
Sterilization and Bio-burden Reduction	317,967	Electron beam or x-ray
Phosphate Manufacturing	2,191	TENORM
Construction	272,945	X-ray, NORM
<b>Totals</b>	<b>968,279</b>	

Applying ratios from previous ICRs, the Agency estimates 13,849 facilities, or 1.43% of the 968,279 facilities which may use ionizing radiation, have employees who require exposure monitoring under the standard.

### Wage Rate Determinations

The Agency determined the wage rate from mean hourly wage earnings to represent the cost of employee time. For the relevant standard occupational classification category, OSHA used the wage rates reported in the Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Employment Statistics* (OES), May 2016 [date accessed: May 1, 2017]. (OES data is available at: <https://www.bls.gov/oes/tables.htm>. To access a wage rate, select the year, “Occupation Profiles,” and the Standard Occupational Classification (SOC) code.)

Ionizing Radiation Standard (29 CFR 1926.1096)  
1218-0103  
October 2017

To account for fringe benefits, the Agency used the benefit rate reported in the *Economic News Release, Employer Costs for Employee Compensation – December 2016*, Bureau of Labor Statistics, U.S. Department of Labor ([https://www.bls.gov/news.release/archives/ecec\\_03172017.htm](https://www.bls.gov/news.release/archives/ecec_03172017.htm) [date accessed: May 1, 2017]). BLS reported that for civilian workers, fringe benefits accounted for 31.6 percent of total compensation and wages accounted for the remaining 68.4 percent. For purposes of this analysis, the Agency uses the 31.6 percent fringe benefit level to represent the average level of fringe benefits in the private sector. To calculate the loaded hourly wage for each occupation, the Agency divided the mean hourly wage by 68.4 percent.

Professional/Manager (11-0000)  $\$56.74 / .684 = \mathbf{\$82.95}$

Clerical/Secretary

- Secretaries and Administrative Assistants (43-6000)  $\$19.39 / .684 = \$28.35$
  - Other Office and Administrative Support Workers (43-9000)  $\$16.31 / .684 = \$23.85$
- Average:  $((28.35 + 23.85) / 2) = \mathbf{\$26.10}$

## **Burden-Hour and Cost Determinations**

The following sections provide details on the methods and procedures used by OSHA to estimate the burden hours and costs resulting from the information-collection requirements of the Standard.

### **(A) Precautionary procedures and personal monitoring (§1910.1096(d))**

#### Whole-Body Monitoring

This provision specifies the conditions under which employers must provide as required the use of appropriate personal-monitoring equipment. The Agency based the burden hours for this provision on the number of workers who require monitoring. OSHA estimated that 1,028,047 workers were at risk for ionizing-radiation exposures in 1980.<sup>9</sup>

The Environmental Protection Agency (EPA) developed a model to estimate the number of workers potentially exposed to ionizing radiation in the medical industry.<sup>10</sup> This model predicts that the number of potentially exposed workers doubles every 14.5 years (i.e., a mean annual growth rate of 5%). Using the logic applied in previous ICRs, the Agency applied this growth

---

<sup>9</sup> From “Phase I: Study of Ionizing Radiation,” Centaur Associates, Inc., August 1980 (amended Oct 1980); exhibits 6-14, 6-19, 6-22, 6-27, and 6-28.

<sup>10</sup> “Occupational Exposure to Ionizing Radiation in the United States: A Comprehensive Review for the Year 1980 and a Summary of Trends for the Years 1960 to 1985,” EPA 520/1/84-005, September 1985.

Ionizing Radiation Standard (29 CFR 1926.1096)  
1218-0103  
October 2017

rate to the previous estimate of 4,784,514 potentially exposed workers in the 2014 ICR (that ICR is based on the data year 2013). Therefore, the Agency estimates the number of these workers will be about 5,815,607 in 2017.

Previous information obtained from the EPA's Office of Radiation Programs and the Centaur Report<sup>11</sup> indicates that employers monitor less than 42% of potentially exposed workers. The Agency applies the 42% to the potentially exposed workers (5,815,607) to estimate 2,442,555 potentially exposed workers monitored. Although employers usually monitor workers who may receive whole-body radiation in excess of 0.1 rem annually, the Standard requires exposure monitoring only if a worker's ionizing-radiation exposure may exceed 25% of the maximum applicable exposure of 1.25 rems in any calendar quarter (i.e., 312.5 mrem). Of the 2,442,555 workers monitored by employers, OSHA estimates that employers monitor .7874% (rounded up to .8%) of these workers (19,540) to comply with the personal-monitoring provisions of the Standard (or  $19,540 = 13,849 \text{ facilities}^{12} \times 1.41093$ ).

Employers typically collect personnel-monitoring devices (i.e., film badges) monthly and mail them in batches to a contract laboratory for analysis. While the exposure data described in the previous paragraph indicate that employers, on average, monitor their workers quarterly, OSHA is assuming that employers with higher exposures will monitor more often. The Agency estimates that a supervisor requires about 10 minutes (.17 hour) each month for distribution, collection, and mailing the film badges. Therefore, the annual burden hours and cost of this provision are:

**Burden hours:**  $13,849 \text{ facilities} \times 1.41093 \times .17 \text{ hour} \times 12 \text{ months}$   
 $= 39,862 \text{ hours}$

**Cost:**  $39,862 \text{ hours} \times \$82.95 = \$3,306,553$

---

<sup>11</sup>From "Phase I: Study of Ionizing Radiation," Centaur Associates, Inc., August 1980 (amended Oct1980); exhibits 6-14, 6-19, 6-22, 6-27, and 6-28.

<sup>12</sup>For purposes of this PRA analysis, the Agency estimates one facility per employer.



Ionizing Radiation Standard (29 CFR 1926.1096)  
1218-0103  
October 2017

### Extremity Monitoring

The Agency estimates that 10% (1,954) of the monitored workers require extremity monitoring (or  $1,954 = 13,849 \text{ facilities} \times .141093$ ).

According to the Centaur Report, industry representatives indicated that most employers provide film-badge monitoring using two badges because this procedure is least costly. OSHA believes using two badges for extremity monitoring does not increase the .17-hour time estimate made above for whole-body monitoring. Accordingly, supervisors collect badges once a month and send them to a consulting service for analysis. The burden and costs of this paperwork requirement are:

**Burden hours:**  $13,849 \text{ facilities} \times .141093 \times .17 \text{ hour} \times 12 \text{ months}$   
 $= 3,986 \text{ hours}$

**Cost:**  $3,986 \text{ hours} \times \$82.95 = \$330,639$

For whole-body and extremity monitoring combined, the total burden hours and costs are:

**Total burden hours:**  $39,862 \text{ hours} + 3,986 \text{ hours} = 43,848 \text{ hours}$

**Total cost:**  $\$3,306,553 + \$330,639 = \$3,637,192$

- (B) Caution signs, labels and signals (§1910.1096(e)) Exceptions from posting Requirements-** No burden hours will be taken. See item 2 of this package.
- (C) Exceptions from posting requirements (§1910.1096(g)) –**  
No burden hours will be taken. See item 2 of this package.
- (D) Exceptions for radioactive materials packaged for shipment (§1910.1096(h))-**  
No burden hours will be taken. See item 2 of this package.
- (E) Instruction of personnel, posting (§1910.1096(i))**

### Instruction of staff

See Item 2, above.

### Posting of Standard by New Establishments

Employers must also post in a conspicuous location in each radiation area a current copy of the Standard and the operating procedures applicable to the work performed in the area or, alternatively, maintain these documents available for examination by workers on request.

Ionizing Radiation Standard (29 CFR 1926.1096)  
1218-0103  
October 2017

The Agency assumes that employers met the requirement to post current copies of the Standard soon after it redesignated the Standard in 1996; therefore, OSHA took no burden for these establishments to post a copy of the Standard. To determine the number of new establishments that may have to post the standard, OSHA is using the 5% growth rate used for workers (discussed under (A) Personal Monitoring). Therefore, the Agency estimates 692 new establishments (13,849 x 5%) will expend 10 minutes (.17 hour) to obtain and post the OSHA standard in radiation areas. The Agency assumes a clerical staff will perform these activities.

**Burden hours:** 692 new facilities x .17 hour = 118 hours

**Cost:** 118 hours x \$26.10 = \$3,080

#### Notification of Workers of Current Operating Procedures

Regarding the requirement to notify workers of current operating procedures, the Agency assumes that employers meet this requirement by posting these procedures in a conspicuous location once a year. For purposes of PRA estimates, OSHA estimates that posting the current operating procedures requires 5 minutes (.08 hour) of clerical time. The Agency estimates 13,849 facilities, including the new facilities (12,392 existing facilities + 692 new establishments), may post operating procedures.<sup>13</sup> Accordingly, the annual burden hours and cost of this requirement are:

**Burden hours:** 13,849 facilities x .08 hour = 1,108 hours

**Cost:** 1,108 hours x \$26.10 = \$28,919

#### **(F) Notification of incidents (§1910.1096(I))**

Based on interviews with Agency staff, for purposes of calculating PRA burden hours, OSHA predicts 1 incident each year that requires the notifications and reports specified by provision (I) (1). The Agency does not believe any of the new establishments would have any incidents. At the present time, the Agency is not aware of any such incident notifications, but uses this estimate in order to maintain approval under the PRA to collect such notifications in the future.

The first information collection requirement, specified in paragraphs (1)(1) and (I)(2) of the Standard, requires employers to contact OSHA immediately or within 24 hours of an incident, depending on the amount of overexposure an employee receives. The Agency estimates that employers will use 5 minutes (.08 hour) of professional time to provide the required notifications.

---

<sup>13</sup> Report prepared by Advance Technologies and Laboratories International, Inc. titled "Background Information Report for an Occupational Ionizing Radiation Protection Standard," vol. 6, September 2000.

Ionizing Radiation Standard (29 CFR 1926.1096)  
1218-0103  
October 2017

**Burden hours:** 1 facility x .08 hour = 1 hour (rounded up to 1)  
**Costs:** 1 hours x \$82.95 = \$83

**(G) Reports of overexposure and excessive levels and concentrations (§1910.1096(m))**

Paragraph (m)(1) of the Standard, requires that employers, within 30 days of an incident, provide a written report of the incident to OSHA. The Agency estimates that a supervisor will take 15 minutes (.25 hour) to write such a report and submit it to OSHA.

Based on interviews with Agency staff, for purposes of calculating PRA burden hours, OSHA predicts 10 such incidents in a year and would require a 24-hour overexposure notice as specified in (l)(2).

**Burden hours:** 10 facilities x .25 hour = 3 hours  
**Costs:** 3 hour x \$82.95 = \$249

Written Incident Notice to Employee

Under paragraph (m)(2), employers must provide written notice to each worker involved in an incident covered by paragraph (l) of the Standard. The written notice must inform the worker of the extent and characteristics of the overexposure received in the incident, and must state that “You should preserve this report for future reference.”

Using the numbers estimated in the equation above, OSHA assumes a secretary will spend 5 minutes (.08 hour) providing this information to each of these workers.

**Burden hours:** 10 facilities x .08 hour = 1 hour  
**Cost:** 1 hour x \$26.10 = \$26

**(H) Records (§1910.1096(n))**

Employers must maintain exposure records for the 19,540 workers who receive personal monitoring in accordance with paragraph (d) of the Standard (19,540 = 13,849 facilities x 1.41093). Every year, employers must inform these workers individually of their exposure results. OSHA estimates that maintaining these exposure records require 5 minutes (.08 hour) of clerical time and that a secretary will spend 15 minutes (.25 hour) compiling the exposure data, and writing and sending each report, for a total of 20 minutes (.33 hour) to complete these tasks. Therefore, the annual burden hours and cost of these requirements are:

**Burden hours:** (13,849 facilities x 1.41093) x .33 hour = 6,448 hours  
**Cost:** 6,448 hours x \$26.10 = \$168,293

**(I) Records disclosure to former employees (§1910.1096(o))**

Employers must provide former workers, on request, with a report of their radiation-exposure history. The Agency assumes that 10% of the 19,540 workers (1,954) will request this information each year (19,540 = 13,849 facilities x .141093). OSHA estimates a clerk will take 15 minutes (.25 hour) to compile the exposure data and provide the report to each worker who makes such a request. The annual burden hours and cost of this requirement are:

**Burden hours:** (13,849 facilities x .141093) x .25 hour = 489 hours  
**Cost:** 489 hours x \$26.10 = \$12,763

Table A12- Estimated Annualized Respondent Burden Hours and Costs

<b>Information Collection Requirements</b>	<b>No. of Respondents Employers/ facilities) [a]</b>	<b>No of Responses per Respondent (Workers per facility x frequency) [b]</b>	<b>Total No. of Responses [c]</b> (a x b=c)	<b>Avg. Burden per Response (in Hrs.) [d]</b>	<b>Total Burden Hours [e]</b> (c x d=e)	<b>Mean Wage Rate [f]</b>	<b>Total Burden Costs [g]</b> (e x f= g)
(A) Precautionary procedures and personal monitoring							
1. Whole Body Monitoring	13,849	1.41093 x 12	234,480	0.17	39,862	\$82.95	\$3,306,553
2. Extremity Monitoring	13,849	.141093 x 12	23,448	0.17	3,986	\$82.95	\$330,639
<b>Total for A.</b>	-		<b>257,928</b>		<b>43,848</b>		<b>\$3,637,192</b>
(B) Cautions signs, labels, and signals	0	0	0	0	0	0	0
(C) Exceptions - Posting Requirements	0	0	0	0	0	0	0
(D) Exemptions for radioactive materials packaged for shipment	0	0	0	0	0	0	0
(E) Instruction							

Ionizing Radiation Standard (29 CFR 1926.1096)  
1218-0103  
October 2017

<b>Information Collection Requirements</b>	<b>No. of Respondents Employers/facilities) [a]</b>	<b>No of Responses per Respondent (Workers per facility x frequency) [b]</b>	<b>Total No. of Responses [c]</b> (a x b=c)	<b>Avg. Burden per Response (in Hrs.) [d]</b>	<b>Total Burden Hours [e]</b> (c x d=e)	<b>Mean Wage Rate [f]</b>	<b>Total Burden Costs [g]</b> (e x f= g)
of personnel, posting							
1. Posting of Standard by New Establishments	692	1 x 1	692	0.17	118	\$26.10	\$3,080
2. Notification of Workers of Current Operating Procedures	13,849	1 x 1	13,849	0.08	1,108	\$26.10	\$28,919
<b>Total for E.</b>	-		<b>14,541</b>		<b>1,226</b>		<b>\$31,999</b>
(F) Notification of Incidents (§1910.1096(l))	<b>1</b>	<b>1</b>	<b>1</b>	0.08	<b>1</b>	\$82.95	<b>\$83</b>
(G) Reports of overexposure and excessive levels and concentrations (§1910.1096(m))							
1. Written Notice to OSHA	10	1	10	0.25	3	\$83	\$249
2. Written Incident Notice to Employee	10	1	10	0.08	1	\$26	\$26
<b>Total for G.</b>	-		<b>20</b>		<b>4</b>		<b>\$275</b>
(H) Records (§1910.1096(n))	13,849	1.41093 x 1	19,540	0.33	6,448	\$26.10	\$168,293
(I) Records Disclosure	13,849	.141093 x 1	1,954	0.25	489	\$26.10	\$12,763
<b>Grand Totals</b>	<b>13,849</b>		<b>293,984</b>		<b>52,016</b>		<b>\$3,850,605</b>

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

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

OSHA estimates that the combined purchase and analysis cost for each whole-body monitoring badge is \$26.17 and is \$26.70 for an extremity-monitoring badge. The Agency used estimates from the previous ICR, which were based on discussions with several laboratories that analyzed film badges to determine radiation exposures, and updated those estimates using the Consumer Price Index for medical care commodities, 6.8%, from 2014-2016 (BLS 2016c). The total annual cost for employers to conduct monthly personal monitoring and extremity monitoring of their workers is:

**Cost:** Whole-body monitoring: 19,540 employees x 12 months x \$26.17 = \$ 6,136,342  
Extremity Monitoring: 1,954 x 2 badges x 12 months x \$26.70= \$ 1,252,123

**Total: \$ 6,136,342+ \$1,252,123 = \$7,388,465**

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

Under the Standard, the Federal government would incur a cost whenever employers provide OSHA with reports of overexposure incidents (see paragraph (l)(1) of the Standard). For PRA purposes only, OSHA predicts that it receives 1 such report of overexposure each year, and that

an OSHA compliance officer (GS-12, step 5), at a wage rate of \$39.19<sup>14</sup> per hour, spends 1 hour reviewing and processing each report. In making this cost determination, the Agency does not account for other occupational costs (e.g., equipment, overhead, and support staff expenses) since these costs are normal expenses and would occur without this requirement. Therefore, the total annual cost for the Federal government to review the required incident reports is:

**Cost:** 1 reports x 1 hour x \$39.19= \$39

**15. Explain the reasons for any program changes or adjustments.**

The Agency is requesting an adjustment increase of 6,799 burden hours from 45,217 to 52,016 hours. This increase is the result of an adjustment of the number of establishments and workers used in this analysis based on updated data. The increase is off-set by a reduction in burden hours due to the determination that employers providing training to workers under paragraph (i) (2) is not considered to be an information collection requirement. Also, the increase is off-set by a reduction in the predicted number of notification of incidents (paragraph (l)) and of overexposure and excessive levels and concentrations (paragraph (m)). The total estimated number of establishments affected by the regulation increased from 12,719 to 13,849, a total adjustment of 1,130 more establishments.

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

OSHA will not publish the information collected under the Standard.

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

OSHA lists current valid control numbers in §§1910.8, 1915.8, 1917.4, 1918.4, and 1926.5 and publishes the expiration date in the Federal Register notice announcing OMB approval of the information collection requirement. (See 5 CFR 1320.3(f)(3)). OSHA believes that this is the most appropriate and accurate mechanism to inform interested parties of these expiration dates.

**18. Explain each exception to the certification statement.**

OSHA is not seeking an exception to the certification statement.

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

---

<sup>14</sup> Source: U.S. Office of Personnel Management, General Schedule and Locality tables, Salary Table 2017-RUS, [https://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/salary-tables/pdf/2017/RUS\\_h.pdf](https://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/salary-tables/pdf/2017/RUS_h.pdf).

Ionizing Radiation Standard (29 CFR 1926.1096)  
1218-0103  
October 2017

This Supporting Statement does not contain any collection of information requirements that employ statistical methods.



**Table A15 – Requested Burden Hours Adjustments**

<b>Collection of information</b>	<b>Current Burden Hours</b>	<b>Requested Burden Hours</b>	<b>Burden Hours Adjustments</b>
(A) Precautionary procedures and personal monitoring			
1. <i>Whole Body Monitoring</i>	32,795	39,862	7,067
2. <i>Extremity Monitoring</i>	3,280	3,986	706
(B) Cautions signs, labels, and signals	0	0	0
(C) Exceptions for Posting Requirements	0	0	0
(D) Exemptions for radioactive materials packaged for shipment	0	0	0
(E) Instruction of personnel, posting			
1. <i>Instruction of Staff</i>	2,162	0	-2,162
2. <i>Posting of Standard by New Establishments</i>	103	118	15
3. <i>Notification of Workers of Current Operating Procedures</i>	1,018	1,108	90
(F) Notification of Incidents (§1910.1096(l))	6	1	-5
(G) Reports of overexposure and excessive levels and concentrations (§1910.1096(m))			
1. <i>Written Notice to OSHA</i>	113	3	-110
2. <i>Written Incident Notice to Employee</i>	36	1	-35
(H) Records (§1910.1096(n))	5,302	6,448	1,146
(I) Records Disclosure	402	489	87
<b>TOTALS</b>	<b>45,217</b>	<b>52,016</b>	<b>6,799</b>