U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REGULATORY RESEARCH

August 2015
Revision 3

DRAFT REGULATORY GUIDE

Technical Lead
Luis A. Benevides

DRAFT REGULATORY GUIDE DG-8030

(*Proposed Revision 3 of Regulatory Guide 8.7, dated November 2005*)

INSTRUCTIONS FOR RECORDING AND REPORTING OCCUPATIONAL RADIATION DOSE DATA

A. INTRODUCTION

Purpose

This regulatory guide (RG) describes methods and procedures that the staff of the U.S. Nuclear Regulatory Commission (NRC) considers acceptable for the preparation, retention, and reporting of records of occupational radiation doses. In addition, it references the updated versions of NRC Form 4, "Cumulative Occupational Dose History" (Ref. 1), and NRC Form 5 "Occupational Dose Record for a Monitoring Period" (Ref. 2), as well as detailed instructions for completing these forms. It applies to both reactor and materials licensees under Title 10 of the *Code of Federal Regulations* (10 CFR), Part 20, "Standards for Protection Against Radiation" (Ref. 3).

Applicable Rules and Regulations

- 10 CFR Part 19, "Notices, Instructions and Reports to Workers: Inspection and Investigations" (Ref. 4), Section 19.13, "Notifications and reports to individuals," requires each licensee to provide dose information to workers as shown in records maintained by the licensee pursuant to NRC regulations.

- 10 CFR 20.1003, "Definitions," define the total effective dose equivalent (TEDE) as the sum of the effective dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures).

    - 10 CFR 20.1502, "Conditions requiring individual monitoring of external and internal occupational dose" requires monitoring of the occupational radiation dose. Specifically, regulations in 10 CFR 20.1502 require licensees to provide radiation monitoring for all occupationally exposed individuals who might receive a dose in excess of the ten percent of the limits defined in 10 CFR 20.1201 or the specific limits for minors and declared pregnant women in 10 CFR 20.1502(a)(2)-(3), or who is entering a very high radiation area.

This regulatory guide is being issued in draft form to involve the public in the development of regulatory guidance in this area. It has not received final staff review or approval and does not represent an NRC final staff position. Public comments are being solicited on this draft guide and its associated regulatory analysis. Comments should be accompanied by appropriate supporting data. Comments may be submitted through the Federal-rulemaking Web site, http://www.regulations.gov, by searching for Docket ID NRC-2015--0203. Alternatively, comments may be submitted to the Rules, Announcements, and Directives Branch, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Comments must be submitted by the date indicated in the *Federal Register* notice.

Electronic copies of this draft regulatory guide, previous versions of this guide, and other recently issued guides are available through the NRC's public Web site under the Regulatory Guides document collection of the NRC Library at http://www.nrc.gov/reading-rm/doc-collections/reg-guides/. The draft regulatory guide is also available through the NRC's Agencywide Documents Access and Management System (ADAMS) at http://www.nrc.gov/reading-rm/adams.html, under Accession No. ML15169A218. The regulatory analysis may be found in ADAMS under Accession No. ML15169A219.

- 10 CFR 20.2104, "Determination of prior occupational dose," requires licensees to determine the dose in the current monitoring year for all persons who must be monitored, and attempt to obtain the records of cumulative occupational radiation dose. In addition, regulations in 10 CFR 20.2104(b) require that, before permitting an individual to participate in a planned special exposure, licensees shall determine the internal and external doses from all previous planned special exposures, and record all previous doses in excess of the limits received during the lifetime of the individual. Licensees are required to maintain prior dose records on an NRC Form 4 or its equivalent.

- 10 CFR 20.2106, "Records of individual monitoring results," requires licensees to maintain records of the radiation exposures of all individuals for whom personnel monitoring is required under 10 CFR 20.1502.

- 10 CFR 20.2206, "Reports of individual monitoring," requires certain licensees to submit to the U.S. Nuclear Regulatory Commission (NRC) an annual report of the results of individual monitoring. Licensees are required to record these annual reports on an NRC Form 5 or its equivalent.

Related Rules and Regulations

- Regulatory Guide 8.34, "Monitoring Criteria and Methods to Calculate Occupational Radiation Doses" (Ref. 5), provides guidance in monitoring an individual's occupational radiation dose.

Purpose of Regulatory Guides

The NRC issues RGs to describe to the licensees and public methods that the staff considers acceptable for use in implementing specific parts of the agency's regulations, to explain techniques that the staff uses in evaluating specific problems or postulated accidents, and to provide guidance to applicants. Regulatory guides are not substitutes for regulations and compliance with them is not required. Methods and solutions that differ from those set forth in RGs will be deemed acceptable if they provide a basis for the findings required for the issuance or continuance of a permit or license by the Commission.

Paperwork Reduction Act

This RG contains information collection requirements covered by 10 CFR Part 20, that the Office of Management and Budget (OMB) approved under OMB control number 3150-0014. The OMB has also approved the existing requirements for NRC Forms 4 and 5 under control numbers 3150-0005 and 3150-0006. The NRC may neither conduct nor sponsor, and a person is not required to respond to, an information collection request or requirement unless the requesting document displays a currently valid OMB control number.

B. DISCUSSION

Reason for Revision

This revision of RG 8.7 (Revision 3) addresses new issues identified since Revision 2 was issued in November 2005. It includes changes in the process a licensee needs to follow for determining the need for monitoring occupational exposure to radiation and clarify previous guidance regarding when personal radiation monitoring is and is not required in order to be consistent with the requirements of 10 CFR Part

19 and 10 CFR Part 20. The revision also describes acceptable methods for determining prior doses, recording monitoring results, and reporting the results, in order to comply with 10 CFR Part 20.

In addition, the revision is referencing revised versions of NRC Forms 4 and 5, as well as detailed instructions for completing these forms. The acronym EDEX for the "effective dose equivalent" (for external exposures) is included in the revised forms to be consistent with the requirement in 10 CFR 20.1003. Also, the term "total organ dose equivalent" (TODE) has been added in the forms to be consistent with the regulations described in 10 CFR 20.2106(a)(6).

Appendix A, "Format for Electronic Submittal of Dose Data," to this guide discusses the new terms of EDEX and TODE for the electronic submittal of occupational dose data to the NRC.

Background

On December 4, 2007, the NRC published a *Federal Register* notice (72 FR 68043) (Ref. 6) that made changes in 10 CFR 19.13 regarding notifications and reports to individuals, and to the definition of TEDE in 10 CFR 20.1003 and 10 CFR 50.2 (Ref. 7).

Under the revised rules, which became effective on January 3, 2008, the TEDE was redefined as the sum of the effective dose equivalent (for external exposures) and the committed effective dose equivalent (CEDE) (for internal exposures). Previously, the definition of the TEDE was the sum of the DDE (to account for external exposure) and the CEDE (to account for internal exposure). Under the revised rule in 10 CFR 20.1003, the TEDE was redefined by replacing the DDE with the effective dose equivalent external (EDEX).

Old definition: TEDE = DDE + CEDE

New definition: TEDE = EDEX + CEDE

The revised TEDE definition also affected the format of NRC Forms 4 and 5 where the EDEX is now a quantity to be recorded when monitoring external dose. Therefore, Revision 3 of this guide provides the updated Forms 4 and 5 to incorporate the EDEX quantity, and to provide instructions on the summation of the EDEX and CEDE to determine the TEDE. Although 10 CFR 20.1003 does not contain an abbreviation for the effective dose equivalent (for external exposures), the acronym EDEX is used by NRC staff to denote this term.

Also, the term "total organ dose equivalent" (TODE) has been added in the forms to denote the sum of the deep dose equivalent (DDE) and the committed dose equivalent (CDE) to the organ receiving the highest dose, to be consistent with the regulations described in 10 CFR 20.2106(a)(6). Although this regulation does not include the acronym TODE, the acronym is used by NRC staff to denote "total organ dose equivalent."

Harmonization with International Standards

The NRC has a goal of harmonizing its guidance with international standards. The International Commission on Radiological Protection (ICRP) and the International Atomic Energy Agency (IAEA) have established a series of safety guides and standards constituting a high level of safety for protecting people and the environment. ICRP and IAEA radiation protection guides present international good practices and increasingly reflect best practices to help users striving to achieve high levels of safety. The NRC encourages licensees to consult the international documents noted throughout this guide and implement the applicable good practices they contain that are consistent with NRC regulations. It should

be noted, however, that some of the recommendations issued by these international organizations do not correspond to the requirements specified in the NRC's regulations. In such cases, the NRC's requirements take precedence. Pertinent to this RG are the following documents that would help implement good radiation protection practices, where applicable.

- International Commission on Radiological Protection (ICRP) Publication 30, "Limits for Intakes of Radionuclides by Workers" (Ref. 8).

- ICRP Publication 68, "Dose Coefficients for Intakes of Radionuclides by Workers" (Ref. 9).

- ICRP Publication 103, "The 2007 Recommendations of the International Commission on Radiological Protection" (Ref. 10).

C. STAFF REGULATORY POSITION

1. Determining the Need to Monitor

Licensees are required under 10 CFR 20.1502 to monitor at levels sufficient to demonstrate compliance with the occupational dose limits.[1] According to 10 CFR 20.1502, at a minimum, monitoring is required if an adult is likely to receive, in a calendar year, a dose greater than ten percent of the limits defined in 10 CFR 20.1201 or the specific limits for minors and declared pregnant women in 10 CFR 20.1502(a)(2)-(3), or who is entering a very high radiation area."

The licensee should evaluate the dose that such an individual is likely to receive before allowing the individual to receive the dose. The licensee need not perform a dose evaluation for every individual; evaluations can be performed for employees with similar job functions or work areas. Regulatory Guide 8.34, "Monitoring Criteria and Methods to Calculate Occupational Radiation Doses," provides further guidance in determining the need to monitor an individual's occupational radiation dose.

1.1 If Monitoring is not Required

If the prospective evaluation shows that an individual is not likely to receive in a calendar year a dose that exceeds the limits set forth in 10 CFR 20.1502, the licensee is not required to keep records or report the individual's dose. Evaluations of minor intakes or exposures (i.e., below the monitoring thresholds) that were anticipated based on the prospective evaluation is not required monitoring. However, monitoring performed to quantify unanticipated intakes or exposures is required monitoring, and results must be recorded and reported accordingly.

For individuals who received a dose at other facilities in the current year, the previous dose should not be considered in this prospective evaluation. Only the dose that could be received at the facility performing the evaluation should be considered when determining the need for monitoring and, therefore, the recordkeeping and reporting requirements.

If the licensee determines that monitoring is not required and a subsequent evaluation shows that the individual exceeded (or will exceed) the monitoring limit threshold, the licensee should estimate, record, and report the dose received even if monitoring was not provided. These estimates can be based

1 Monitoring performed to quantify unanticipated intakes or exposures, are required monitoring per 10 CFR 20.1502, regardless of the magnitude of the resulting doses.

on any combination of work location radiation monitoring or survey results, monitoring results of individuals in similar work situations, or other estimates to produce a "best estimate" of the actual dose received.

If monitoring is not required to demonstrate compliance with all limits, but it is required relative to one or more specific limits, the licensee should enter "NR" for "Not Required" in the blocks on NRC Forms 4 and 5 to indicate the areas for which monitoring was not required (e.g., extremity or skin doses). Where monitoring was provided but the dose was not measurable, the licensee should enter "ND" for "Not Detectable."

1.2 If Monitoring is Required

If the prospective evaluation shows that an individual is likely to receive in a calendar year a dose that exceeds the specified percentage of the limits set forth in 10 CFR 20.1502, then the licensee must perform monitoring. In addition, 10 CFR 20.2106(a) and 20.2206(b), respectively, require recording and reporting of the monitoring results, regardless of the actual dose received (even if the actual dose received is less than the dose limits for which monitoring is required).

1.3 Documentation of Prior Doses

For those individuals for whom monitoring is required (i.e., individuals who receive, or are likely to receive, an occupational dose requiring monitoring pursuant to 10 CFR 20.1502), the licensee shall determine the individual's current year dose pursuant to 10 CFR 20.20.2104(a). Licensees may accept records of prior current year dose from several sources, as listed in 10 CFR 20.2104(c). If the authenticity of the dose data obtained by any of these sources cannot be established, the licensee is required, per 10 CFR 20.2104(c)(3) to request a written verification.

In addition, before permitting an individual to participate in a planned special exposure, 10 CFR 20.2104(b) requires licensees to obtain records of all doses received by the individual from prior planned special exposures and any dose received in excess of an annual occupational dose limit.

NRC Forms 4 and 5 undergo OMB review and approval on a 3-year frequency. Licensees are not required to revise, retrospectively, historical dose records to reflect the content or format of the currently approved versions of the forms. NRC Forms 4 and 5, termination letters, or reports that document the results of monitoring performed before implementation of the 1991 revision of 10 CFR Part 20, may be used without recalculating doses, according to the requirements of the 1991 revision of 10 CFR Part 20. For the purpose of assessing prior doses, whole body doses, in rem, as reported in the old NRC Forms 4 and 5 (from 1981 or earlier) can be considered equivalent to TEDE.

1.4 Records of Prior Doses for Persons Participating in Planned Special Exposures

If the monitored individual has any periods of exposure (throughout his or her life) that have not been monitored and documented, the individual is not permitted to participate in a planned special exposure. Regulatory Guide 8.35, "Planned Special Exposures" (Ref. 11), provides further guidance on planning and controlling planned special exposures. Acceptable documentation of prior exposure is similar to that required to document current-year exposure. The licensee may ask the NRC to provide a report of the monitored individual's exposure history, by submitting a request via the NRC's Radiation Exposure Information and Reporting System (REIRS) for Radiation Workers (a secure web site) at

http://www.reirs.com. Alternatively, the licensee may send a request signed by the monitored individual to the following point-of-contact:

REIRS Project Manager
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Each request should contain the Social Security number (or other unique identifier) of the monitored individual authorizing release of the information and the name and address of the person or licensee to whom the report should be sent. The NRC's REIRS database contains copies of all licensee exposure records submitted to the NRC. However, the database only contains reports submitted by the seven classes of licensees that 10 CFR Part 20 requires to report occupational exposures. Any missing monitoring periods should be obtained directly from licensees or other non-NRC-licensed facilities (e.g., DOE, or DOD facilities).

1.5 Use of ID Types Other than Social Security Number

Doses to individuals who do not have a Social Security number, such as citizens of foreign countries, and individuals who are either unwilling or unable to provide (cannot locate or do not want to disclose) a Social Security number, should be reported using another unique identifier. It is important to record the type of identification in the data block labeled "ID Type," which follows the "Identification Number" data block on NRC Forms 4 and 5. The instructions on the back of these forms define all valid ID types. Licensees should insert the appropriate code (listed below) in the blank labeled "ID Type."

ID TYPE	CODE
U.S. Social Security Number	SSN
Passport Number	PPN
Canadian Social Insurance Number	CSI
Work Permit Number	WPN
INDEX Identification Number	IND
PADS Identification Number	PAD
Other	OTH

The use of licensee-generated identification numbers should be avoided whenever possible.

2. Records of Monitoring Results for Individuals for Whom Monitoring Is Required

The preparation of NRC Form 5 with the information clearly and legibly shown, or the collection of all information requested by NRC Form 5 using paper or electronic media (see Appendix C), is

required by 10 CFR 20.2106. Title 10 CFR 20.1502 requires that licensees shall maintain such records for each individual for whom occupational monitoring is required. In addition, certain classes of licensees are required to report the results of this monitoring to the NRC, under 10 CFR 20.2206, either by submitting copies of NRC Form 5 or by transmitting the required information to the NRC through electronic media. This report, covering the preceding year, must be filed on or before April 30 of each year. NRC Form 5 provides instructions and other information pertinent to each item.

2.1 Multiple Badges

Regulatory Guide 8.40, "Methods for Measuring Effective Dose Equivalent from External Exposure" (Ref. 12), offer guidance on interpreting the results of multiple dosimetric devices placed at different locations on the body to track doses to various parts of the whole body.

2.2 Dose Calculations for CDE and TODE to the Maximally Exposed Organ

As required by 10 CFR 20.2106(a)(6), licensees shall record, when applicable, the TODE, which is the sum of the DDE and the CDE to the organ receiving the highest dose (the maximally exposed organ) when monitoring is required by 10 CFR 20.1502.[2] If internal monitoring required by 10 CFR 20.1502(b) for adults demonstrates that the annual CEDE is being kept below 1 rem (10 mSv),[3] the CDE is not required to be monitored (calculated) separately, as long as the annual maximum DDE is also kept below 5 rem (50 mSv). This is because the CEDE and DDE monitoring is sufficient to demonstrate that the TODE limit has not been exceeded. In this case, the licensee may record "NC" for "Not Calculated" in items 16 and 18 on NRC Forms 4 and 5.

However, if during the course of the year, the CEDE to date for the year exceeds 1 rem (10 mSv) or the individual receives an external exposure in excess of 5 rem (50 mSv) DDE, the licensee is required to calculate, record, and report the CDE and TODE to the maximally exposed organ. RG 8.34 provides added guidance on calculating CDE and TODE.

2.3 Dose to the Embryo/Fetus

A declared pregnant worker is an occupational worker who has voluntarily informed her employer (in writing) of her pregnancy and the estimated month and year of conception. In such instances, the licensee shall record the dose to the embryo/fetus for the entire gestation period per 10 CFR 20.2106(e), but the dose to the embryo/fetus need not be reported on NRC Forms 4 and 5. Multiple records are not required in the case of multiple births (twins, triplets, etc.). Licensees are required to record any dose measured to demonstrate compliance with 10 CFR 20.1208.

Licensees should be sensitive to the issue of personal privacy with regard to the dose to the embryo/fetus. If requested by the monitored woman, a letter report may be provided to subsequent licensees to document prior embryo/fetus dose. Regulatory Guide 8.36, "Radiation Dose to the Embryo/Fetus" (Ref. 13), provides further guidance on assessing the dose to the embryo or fetus.

---

[2] Regulations in 10 CFR 20.1502(b) require licensees to monitor intakes and assess CEDE for adults likely to receive an intake in excess of 10 percent of the applicable Annual Limit on Intake (ALI). The regulations in 20.1502(b) do not require assessing CDE. However, 10 CFR 20.1502 does require the licensee to provide monitoring sufficient to demonstrate compliance with the occupational dose limits, including the limit on the sum of the DDE and the CDE in 10 CFR 20.1201(a))1)(ii).

[3] The value of 1 rem (10 mSv) is based on the most limiting tissue weighting factor (i.e., the weighting factor for the thyroid tissue is 0.03; therefore, 1 rem (10mSv) divided by thyroid weighting factor of 0.03 results in a CDE of 33.3 rem (333 mSv). A CDE value of 33.3 rem (333 mSv), when added to an assumed 5 rem (50 mSv) DDE value, is less than the CDE limit of 50 rem (500 mSv).

2.4 Preferred Units

The preferred unit of dose is the "rem." The preferred unit for intakes is the microcurie (μCi). The licensee may record quantities in SI units in parentheses following each of the preferred units.

2.5 Round-off of Doses

Licensees should round doses to the nearest 0.001 rem (0.01 mSv) on NRC Forms 4 and 5. Therefore, a calculated or computer-generated dose of "0.006192" should be entered as "0.006 rem," and a value of "0.000291" should be entered as "0" rem.

2.6 Transmittal of Reports to the NRC

As required by 10 CFR 20.2206(c), designated licensees shall submit reports of monitoring for the previous year to the NRC on or before April 30 of each year. The regulations in 10 CFR 20.2206(b) states, in part, that, "The licensee shall use Form NRC 5 or electronic media containing all the information required by Form NRC 5." Licensees shall submit their reports to the REIRS project manager by an appropriate method listed in 10 CFR 20.1007 or via the REIRS Web site at http://www.reirs.com. Reports submitted by mail should be addressed as follows:

REIRS Project Manager
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, DC 20555

2.7 Electronic Reporting of Dose Data

Licensees (especially those with a large number of monitored individuals) are encouraged to record and report these data electronically. Appendix C to this guide provides guidance for reporting radiation dose data to the NRC in an electronic, machine-readable format.

D. IMPLEMENTATION

The purpose of this section is to provide information to applicants and licensees regarding the NRC's plans for using this regulatory guide.

Methods or solutions that differ from those described in this regulatory guide may be deemed acceptable if they provide sufficient basis and information for the NRC staff to verify that the proposed alternative demonstrates compliance with the appropriate NRC regulations. Current licensees may continue to use guidance the NRC found acceptable for complying with the identified regulations as long as their current licensing basis remains unchanged.

The first issuance of new guidance on a new rule provision does not constitute backfitting, inasmuch as the guidance on the new rule provision must be consistent with the regulatory requirements in the new rule provision, and the backfitting basis for the new rule provision should also be applicable to the issuance of guidance on that new rule provision. The statement of considerations for the 2007 revisions to Parts 19 and 20 stated that the specific changes made to the regulations did not constitute "backfitting" as defined in 10 CFR 50.109.

Therefore, for licensees subject to the provisions of 10 CFR Part 50 and/or Part 52, the first issuance of new guidance addressing new provisions of 10 CFR Parts 19 and 20 (if finalized), would not constitute issuance of a new or different staff position within the meaning of the definition of ''backfitting'' in 10 CFR 50.109, or constitute an action inconsistent with any of the issue finality provisions in 10 CFR Part 52. Accordingly, no further consideration of backfitting is needed to support issuance of this draft regulatory guide.

REFERENCES[4]

1. U.S. Nuclear Regulatory Commission (NRC) Form 4, "Cumulative Occupational Dose History," NRC, Washington, DC.

2. NRC Form 5, "Occupational Dose Record for a Monitoring Period," NRC, Washington, DC.

3. *U.S. Code of Federal Regulations* (CFR), "Standards for Protection against Radiation," Part 20, Chapter I, Title 10, "Energy" (10 CFR Part 20).

4. CFR, "Notices, Instructions, and Reports to Workers: Inspection and Investigations," Part 19, Chapter 1, Title 10, "Energy" (10 CFR Part 19).

5. NRC, Regulatory Guide (RG) 8.34 "Monitoring Criteria and Methods To Calculate Occupational Radiation Doses." NRC, Washington, DC.

6. NRC, "Occupational Dose Records, Labeling Containers, and the Total Effective Dose Equivalent," *Federal Register*, Vol. 72, No. 232, December 4, 2007, pp. 68043-68059 (72 FR 68043).

7. CFR, "Domestic Licensing of Production and Utilization Facilities," Part 50, Chapter 1, Title 10, "Energy" (10 CFR Part 50).

8. International Commission on Radiological Protection (ICRP), "Limits for Intakes of Radionuclides by Workers," ICRP Publication 30 (Part 1), Ann. ICRP 2 (3-4), 1979. [5]

9. ICRP, "Dose Coefficients for Intakes of Radionuclides by Workers," ICRP Publication 68, Ann. ICRP 24(4), 1994.

10. ICRP, "The 2007 Recommendations of the International Commission on Radiological Protection," ICRP Publication 103, Ann. ICRP 37 (2-4), 2007.

11. NRC, RG 8.35, "Planned Special Exposures." NRC, Washington, DC.

12. NRC, RG 8.40 "Methods for Measuring Effective Dose Equivalent from External Exposure." NRC, Washington, DC.

13. NRC, RG 8.36 "Radiation Dose to the Embryo/Fetus." NRC, Washington, DC.

4 Publicly available NRC-published documents are available online through the NRC Library on the NRC's public Web Site at http://www.nrc.gov/reading-rm/doc-collections/. The documents can also be viewed online or printed for a fee in the NRC's Public Document Room (PDR) at 11555 Rockville Pike, Rockville, MD; the mailing address is USNRC PDR, Washington, DC 20555; telephone 301-415-4737 or (800) 397-4209; fax (301) 415-3548; and e-mail pdr.resource@nrc.gov.

5 Copies of the International Commission on Radiological Protection (ICRP) may be obtained through their Web site: http://www.icrp.org/; 280 Slater Street, Ottawa, Ontario K1P 5S9, CANADA; Tel: +1(613) 947-9750 Fax: +1(613) 944-1920.

APPENDIX A

FORMAT FOR ELECTRONIC SUBMITTAL OF DOSE DATA

Introduction

This appendix outlines a means by which licensees may satisfy the requirements of Title 10, Section 20.2206, "Reports of Individual Monitoring," of the *Code of Federal Regulations* (10 CFR 20.2206). Where practicable, the U.S. Nuclear Regulatory Commission (NRC) prefers to have licensees submit an electronic file via the Radiation Exposure Information and Reporting System (REIRS) for radiation workers (a secure Web site) at http://www.reirs.com. Regardless of submittal method, licensees who have their exposure records in an electronic format are encouraged to submit electronic files. This is especially important for those licensees who have a large number of monitored individuals, because manual data entry is inefficient and can introduce an additional source of error.

Media Requirements

If the secure web site submittal process is not used, other data submission formats may also be acceptable. Upon request, the NRC REIRS Project Manager will provide additional guidance to licensees in order for them to submit records on electronic media.

Transmittal Letters

Licensees should submit a transmittal letter containing information that will minimize processing time and help resolve possible discrepancies. Each letter should contain the following information (as a minimum):

- File name — Descriptive name of the file(s).
- Date created — Date each file was created.
- Operating system — Operating system and version used to generate the data file.
- Contact — Name and telephone number of the cognizant point-of-contact.
- Other instructions — Comments or explanation regarding the data format, or other important information regarding the data file.
- Signature and date — Dated signature of the licensee's authorized representative responsible for the data.
- Other information — Licensees are encouraged to include additional information, such as a change in operational status, radiation protection, or monitoring practices that may affect occupational radiation exposure and may be useful to the NRC in evaluating or assessing the annual submittal.

Expected Data

Each licensee is expected to submit at least one routine NRC Form 5 for each monitored individual at the given facility for each monitoring year. Licensees may also submit an NRC Form 5 for planned special exposures for individuals, if planned special exposures were authorized. Each NRC Form 5 also includes the primary license number to ensure that the records are assigned to the proper facility.

File Structure

The file structure consists of a header record, which provides information about the source of the data file, followed by NRC Form 5 dose records and supporting NRC Form 5 intake records. Where applicable, the file may also include one or more NRC Form 5 comment records to explain special exposure calculations or exposures in excess of regulatory limits. Each record contains only American Standard Code for Information Interchange (ASCII) or Extended Binary Coded Decimal Interchange Code (EBCDIC) printable characters and is terminated with a carriage return and a line feed. All empty space in a field is padded with spaces.

Header Record

The header record occurs only once at the top of each file to identify the source of the data.

Field	Width	Start Col.	End Col.	Description
Primary_License	13	1	13	Primary NRC license number
Version	10	15	24	Version of Regulatory Guide 8.7 in effect at the time of this submittal. Formatted as "RG8.7Rev3."
Preparation_Date	8	26	33	Date the record was written to the data file formatted as "YYYYMMDD"
Licensee_Name	72	35	106	Name of NRC licensee
Contact	72	108	179	Name of person to contact for further information about this data file
Phone_Number	14	181	194	Contact's phone number
Other_License_1	13	196	208	Other related NRC license number
Other_License_2	13	210	222	Other related NRC license number
Other_License_3	13	224	236	Other related NRC license number
Other_License_4	13	238	250	Other related NRC license number
Other_License_5	13	252	264	Other related NRC license number
Other_License_6	13	266	278	Other related NRC license number
Other_License_7	13	280	292	Other related NRC license number

Field	Width	Start Col.	End Col.	Description
Other_License_8	13	294	306	Other related NRC license number
Other_License_9	13	308	320	Other related NRC license number
Other_License_10	13	322	334	Other related NRC license number

NRC Form 5 Dose Record

The data file contains one dose record for each NRC Form 5 being reported. Each dose record may be followed by zero or more NRC Form 5 intake records.

Field	Width	Start Col.	End Col.	Description
Employee_ID	12	1	12	SSN, PPN, CSI, WPN, PAD, or OTH (IDs should have no punctuation.)
ID_Type	3	14	16	"SSN," "PPN," "CSI," "WPN," "PAD," or "OTH"
Primary_License	13	18	30	Primary NRC license number
Preparation_Date	8	32	39	Date the record was written to the data file, formatted as "YYYYMMDD"
Record_Type	1	41	41	"D" = DOSE
First_Name	25	43	67	Employee's full first name (no nicknames)
Middle_Initial	1	69	69	Employee's middle initial
Last_Name	25	71	95	Employee's last name (Titles such as "Jr" should be separated from the last name by a space, without any punctuation.)
Sex	1	97	97	Employee's sex: "M" = Male and "F" = Female
Birth_Date	8	99	106	Employee's date of birth, formatted as "YYYYMMDD."
Monitoring_Start	8	108	115	Date monitoring began, formatted as "YYYYMMDD." (This typically is January 1 of the monitoring year for everyone except new hires.)

Field	Width	Start Col.	End Col.	Description
Monitoring_End	8	117	124	Date monitoring ended, formatted as "YYYYMMDD." (This typically is December 31 of the monitoring year for everyone except terminations.)
Report_Type	1	126	126	"R" = Record, or "E" = Estimate
Exposure_Type	1	128	128	"R" = Routine, or "P" = PSE
EDEX	8	130	137	Effective dose equivalent from external sources for the entire monitoring period in rem, formatted as "999.999."
DDE	8	139	146	Deep dose equivalent for the entire monitoring period in rem, formatted as "999.999."
LDE	8	148	155	Eye dose equivalent to the lens of the eye in rem, formatted as "999.999."
SDE_WB	8	157	164	Shallow dose equivalent, whole body in rem, formatted as "999.999."
SDE_ME	8	166	173	Shallow dose equivalent, max extremity in rem, formatted as "999.999."
CEDE	8	175	182	Committed effective dose equivalent in rem, formatted as "999.999."
CDE	8	184	191	Committed dose equivalent, formatted as "999.999"
TEDE	8	193	200	Total effective dose equivalent, formatted as "999.999." The sum of EDEX and CEDE.
TODE	8	202	209	Total organ dose equivalent, maximally exposed organ, formatted as "999.999." The sum of DDE and CDE.

Form 5 Intake Record

The data file should include an intake record for each intake on the NRC Form 5 being reported.

Field	Width	Start Col.	End Col.	Description
Employee_ID	12	1	12	SSN, PPN, CSI, WPN, PAD, or OTH (IDs should have no punctuation.)
ID_Type	3	14	16	"SSN," "PPN," "CSI," "WPN," "PAD," or "OTH"
Primary_License	13	18	30	Primary NRC license number
Preparation_Date	8	32	39	This is the date from the parent **NRC Form 5 Dose Record**, formatted as "YYYYMMDD"
Record_Type	1	41	41	"I" = Intake
Radionuclide	9	43	51	Radionuclide abbreviation with the hyphen (e.g., U-234)
Class	1	53	53	Enter the pulmonary clearance class designator for inhalation mode. "D," "Y," "W," "V," "F," "M," "S," or "O" for Other. If the intake mode is not inhalation, enter the abbreviation for the intake mode here, as well as in the Mode column.
Mode	1	55	55	"H" = Inhalation, "B" = Absorption, "J" = Injection, or "G" = Ingestion
Intake	10	57	66	The amount of μCi for the radionuclide (This can be expressed in scientific notation using the format "+9.999E+99" or as a decimal number of less than 9 digits.)

Form 5 Comment Record

The data file only includes this record type when comments are necessary to explain special exposure calculations or overexposures.

Field	Width	Start Col.	End Col.	Description
Employee_ID	12	1	12	SSN, PPN, CSI, WPN, PAD, or OTH (IDs should have no punctuation.)
ID_Type	3	14	16	"SSN," "PPN," "CSI," "WPN," "PAD," or "OTH"
Primary_License	13	18	30	Primary NRC license number
Preparation_Date	8	32	39	This is the date from the parent **NRC Form 5 Dose Record**, formatted as "YYYYMMDD"
Record_Type	1	41	41	"C" = Comment
Comment	240	43	282	Explanatory comment (when needed)