

## FRCM CHAPTER 7 RADIOLOGICAL RECORDS

### Revision History

<b>Author</b>	<b>Description of Change</b>	<b>Revision Date</b>
J. D Cossairt	1. Reformulated in light of Fermilab-wide ESH&Q reorganization. 2. Editorial corrections as needed,	July 2015
J. D. Cossairt	3. Add Article 782 to include specific reporting requirements required by DOE Order 231.1B	December 2011

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## **PART 1 REQUIREMENTS**

### **711 Purpose**

This chapter contains the prescribed practices for preparing and retaining radiologically related records. Radiological control records are needed to demonstrate the effectiveness of the overall program. The work force and management are required to use records to document radiological safety afforded to personnel on site. Records of radiological programs may be required to support worker health studies and future disputes or claims. Therefore, these records should be high quality, readily retrievable and managed for the prescribed retention period. Consideration should be given to cross-referencing related records to aid retrievability. Records should be handled such that personal privacy is protected in accordance with the requirements of Fermilab's formal program for protection of Protected Personally Identifiable Information (PII). This applies to both records on both paper and electronic media.

### **712 Records Management Program**

1. A radiological records management program has been established at Fermilab. This program ensures that auditable records and reports are controlled through the stages of creation, distribution, use, arrangement, storage, retrieval, media conversion (if applicable) and disposition. The records management program includes the following:
  - a. Radiological Policy Statements
  - b. Radiological Control Procedures
  - c. Individual Radiological Doses
  - d. Internal and External Dosimetry Policies and Procedures
  - e. Personnel Training (course records and individual records)
  - f. ALARA Records
  - g. Radiological Instrumentation Test, Repair and Calibration Records
  - h. Radiological Surveys
  - i. Area Monitoring Dosimetry Results
  - j. Radiological Work Permits

- k. Radiological Performance Indicators and Assessments
  - l. Radiological Safety Analysis and Evaluation Reports
  - m. Quality Assurance Records
  - n. Radiological Incident and Critique Reports
  - o. Accountability records for sealed radioactive sources
  - p. Reports of loss of radioactive material
  - q. Radiation safety interlocks test records.
  - r. Shielding assessments (FRCM Chapter 8) and Safety Assessment Documents (see FESHM 2010.)
- 2. Where radiological services (for example, dosimetry and laboratory analyses) are subcontracted services, there should be a clear agreement regarding records responsibility during performance of the service. Records of results should reside in the custody of the originating contract organization.
  - 3. DOE Orders on records retention provide implementing instructions, records inventory requirements, disposition schedules and provisions for the transfer of records.
  - 4. The Privacy Act of 1974 contains requirements to protect the privacy of individual records.

### **713 Recordkeeping Standards**

- 1. Radiological control records shall be accurate, legible, and written in a professional manner. The records should include the following:
  - a. Identification of the facility, specific location, function and process
  - b. Signature or initials or other identifying code of the preparer and date
  - c. Legible entries in readable ink, black is preferred
  - d. Corrections identified by a single line-out, initialed and dated

- e. Supervisory signature to ensure review and proper completion of forms.
2. Radiological control records should not include:
    - a. Opaque substances for corrections (corrections should be made by “crossout”)
    - b. Shorthand or other nonstandardized terms.
  3. Unless otherwise specified, the quantities used in the radiological records required by this Manual shall be clearly indicated in special units of curie, rad, roentgen, or rem, including multiples and subdivisions of these units, or other conventional units, such as dpm, dpm/100 cm<sup>2</sup>, or mass units. The SI units, becquerel (Bq), gray (Gy), and sievert (Sv), may be provided parenthetically for reference with scientific standards.

## **PART 2 RADIOLOGICAL RECORDS FOR INDIVIDUALS**

### **721 Personnel Radiological Records**

1. Radiation dose records shall be maintained for all individuals for whom monitoring was required by 10 CFR 835.402 and doses received during planned special exposures, accidents, and emergency conditions. These records, including zero doses, shall be readily accessible to monitored individuals. In addition, the results of individual external and internal dose measurements that are performed, but are not required by 10 CFR 835.402, shall be recorded. The dosimetry system used in these radiological records shall be consistent with that used in Fermilab's Department of Energy Laboratory Accreditation Program (DOELAP) accreditation at the time dosimetry results are issued.
2. Radiation dose records shall contain information sufficient to uniquely identify each individual, accomplished preferably by the use of social security number or employee number.
3. Procedures, data and supporting information needed to reconfirm an individual's dose at a later date shall be maintained.
4. External dose records shall include the following:
  - a. Applicable extremity, skin, eye and whole body dose results measured with personnel dosimeters, including all multiple dosimeter badging results
  - b. Evaluations resulting from anomalous dose results such as unexpected high or low doses
  - c. Dose reconstructions from lost or damaged dosimeters
  - d. Evaluations of non-uniform radiation doses.
  - e. Exposure investigations, reports, and supplemental documents generated for individuals who may have received exposures which were unmonitored or measured with inappropriate dosimetry.
5. Internal dose records shall include the following:
  - a. Committed effective dose
  - b. Committed effective dose to any organ or tissue of concern; and
  - c. Estimated intake and identity of radionuclides as determined by

- whole body and/or lung counting results (including chest wall thickness measurements where applicable)
  - urine, fecal, and specimen analyses
  - air monitoring records
6. Records of summation of external effective dose and equivalent dose to any organ receiving a reportable equivalent dose shall be maintained for the individual receiving such dose.
  7. The total effective dose received by each monitored individual shall be maintained for each year the individual is monitored.
  8. The equivalent dose to the embryo/fetus of a declared pregnant worker shall be maintained with the occupational dosimetry records for the worker. In the absence of specific embryo/fetal monitoring, the equivalent dose to the embryo/fetus will be assumed to be the effective dose received by the declared pregnant worker during the reporting quarters overlapping the gestation period.
  9. Records of lifetime occupational dose shall be maintained with the individual's occupational dosimetry records.
  10. Efforts shall be made to obtain records of prior occupational internal and external dose received at other facilities. U.S. Nuclear Regulatory Commission Form 4 or equivalent that document previous occupational radiation doses shall be retained. In the absence of formal records of previous occupational history for the current calendar year, a written estimate signed by the individual may be accepted (See R. P. Form #1)
  11. Records of authorizations to exceed Administrative Goals shall be retained.
  12. Emergency doses and planned special exposures shall be accounted for separately, but maintained with the individual's occupational dosimetry records.
  13. Records of non-uniform dose to the skin caused by contamination on the skin need not be retained in the personnel dose records if the dose is less than 2 percent of the limit for the skin in Table 2-1.
  14. Recording of internal dose is not required for any monitoring result estimated to correspond to an individual receiving less than 0.01 rem. The bioassay or air monitoring results used to make the estimate shall be maintained in the records and

- the unrecorded internal dose estimated for any individual in a year shall not exceed the applicable monitoring threshold in Article 521.
15. Historical doses, recorded to individuals using dosimetry methodology predating the full implementation of the requirements of 10 CFR 835 promulgated in the Federal Register, Vol. 72, No. 119, Docket No. EH-RM-02-835, pp. 31904-31941, June 8, 2007 or received as prior-years doses from non-Fermilab entities shall be regarded as the official doses of record.
  16. The complete records of radiological incidents and occurrences involving personnel dose shall be retained.
  17. These records shall be maintained by the ES&H Section.

## **722 Medical Records**

1. All medical records at Fermilab are maintained by the Fermilab Medical Department.
2. Medical evaluations and treatment performed in support of the radiological program should be documented. Such evaluations and treatments are extremely improbable for conditions at Fermilab but conceivable could be employed to reduce the committed equivalent dose due to a significant uptake of radioactive material.
3. Records of formal written declarations of pregnancy, records of revocations of such declarations, as well as records indicating that the pregnancy has concluded shall also be maintained by the Fermilab Medical Department.
4. Due to employee privacy considerations, these physical examination records shall be maintained by the Fermilab Occupational Medical Director. ES&H personnel shall have access to this information on an as-needed basis with notification of the employee to evaluate exposures, assess a workplace, or investigate incidents.

## **723 Radiological Training and Qualification Records**

1. Records of training and qualification in radiological control shall be maintained to demonstrate that an individual received appropriate information to perform the work assignment in a safe manner. Qualification standard records shall be retained for applied training as well as for formal classroom training.
2. These records shall be maintained by the ESH&Q Section in accord with general ES&H training policies specified in the Fermilab ES&H Manual-Chapter 2070.



3. Personnel training records shall be controlled and retained. At a minimum, these records shall include the following:
  - a. Course title
  - b. Attendance sheets with instructor's name
  - c. Employee's name, identification number and signature
  - d. Date of training
  - e. Identification of the examination or evaluation form, including sufficient data to identify which test each individual completed
  - f. Verification document or record confirming satisfaction of the training requirement
  - g. Documentation related to exceptions for training requirements and extensions of qualification
  - h. Quizzes, tests, responses and acknowledgments of training, with the date and signature of the individual trained.
  
4. Records shall be retained for the following types of training:
  - a. General Employee Radiological Training
  - b. Radiological Worker training, including radioactive waste generator training
  - c. Periodic retraining
  - d. Respiratory protection training
  - e. Training of radiological control personnel
  - f. Instructor training
  - g. Qualifications for special tests or operations
  - h. Orientation and training of visitors

- i. Training of emergency response personnel
  - j. Radioactive source training
  - k. Radiological Control Technician training
  - l. Controlled Access training
  - m. Subcontractor training
5. The following instructional materials shall be maintained:
- a. Course name, with revision and approval date
  - b. Instructor's manuals, course content, or lesson plans containing topical outlines
  - c. Video, computer, and audio instructional materials, including the dates and lessons for which they were used
  - d. Handouts or other materials retained with the master copy of the course
  - e. Job-specific training documents, such as instrument use, radiological procedures, Radiological Work Permit special training requirements, pre-job briefings and mock training.

## **PART 3 VISITORS**

### **731 Record Requirements**

For visitors entering an area where radiation monitoring is required, the following records shall be maintained:

1. Documentation of completion of Radiological Orientation including a synopsis of the topics covered shall be maintained for visitors entering an area where radiation monitoring is required.
2. Records of doses, including zero dose, received by all visitors for whom monitoring was performed shall be maintained. These records shall be sufficient to evaluate compliance with all applicable dose limits and monitoring and reporting requirements.

### **732 Reports**

Upon written request from an individual, a summary of dose equivalent received during the visit shall be provided to that individual as soon as the data are available, but no later than 90 days after termination of the visit. Requests received after the individual has left the site will be honored within 90 days from the date the request is received by the Dosimetry Program Manager.

## **PART 4 RADIOLOGICAL CONTROL PROCEDURES**

### **741 Policies, Procedures and Radiological Work Permits**

Records of the Radiological Control Program should consist of policy statements, procedures, Radiological Work Permits and supporting data as well as this Manual, its past editions, and the past editions of its predecessor, *The Fermilab Radiation Guide*. The records should be maintained in a chronological sequence that will allow correlation with the corresponding support information. For example, procedures for performing radiation surveys should be identifiable with the survey results. Completed Radiological Work Permits should be maintained. Divisions/sections/centers shall maintain the records of their individual activities while the ES&H Section shall maintain those pertinent to its operations and, where appropriate, the Laboratory as a whole.

### **742 ALARA Records**

Records of formal As-Low-As-Reasonably-Achievable (ALARA) reviews shall be maintained to demonstrate the adequacy of the ALARA Program. ALARA topics are documented in the minutes of Radiation Safety Subcommittee and other committees where radiological safety issues are formally discussed. ALARA records shall be maintained by the line organizations for their activities and copies forwarded to the ES&H central file.

### **743 Quality Assurance Records**

The Fermilab Integrated Quality Assistance Program contains Laboratory policies concerning quality assurance. Records of quality assurance reviews and audits developed for Radiological Control functions shall be retained to ensure that sufficient records are specified, prepared, reviewed, approved and maintained to accurately reflect completed work.

## PART 5 RADIOLOGICAL SURVEYS

### 751 Requirements

1. Radiological Control Programs require the performance of appropriate radiological surveys to determine existing conditions in a given location. Maps with sufficient detail to permit identification of original survey and sampling locations should be maintained. Records shall contain sufficient detail to be meaningful even after the originator is no longer available. Radiological surveys should be recorded on appropriate standard forms and include the following common elements:
  - a. Date, time, and purpose of the survey
  - b. General and specific location of the survey
  - c. Type of survey instrument, calibration due date, and Fermi instrument identification number, as appropriate
  - d. Name or initial of the surveyor
  - e. Pertinent special information needed to interpret survey results (e.g., unusual background levels, special survey distances, etc.)
  - f. Reference to a specific Radiological Work Permit if the survey is performed to support the permit (unless an alternate method of tracking survey maps with RWPs is employed).
2. Refer to Chapter 5-Part 5 for specific requirements regarding area radiological surveys.

**PART 6 INSTRUMENTATION AND CALIBRATION RECORDS****761 Calibration and Operational Checks**

1. Calibration records for fixed, portable, and laboratory radiation measuring equipment and individual monitoring devices shall be maintained and include frequencies, method, dates, personnel, training, and traceability of calibration sources to National Institute of Science and Technology or other acceptable standards. These records are maintained by the ES&H Section.
2. Refer to Chapter 5-Part 6 for calibration requirements.

## **PART 7 RECORDS MANAGEMENT**

### **771 Media**

A combination of media may be used for a comprehensive records system. For records that have long-term retention requirements and are stored on media subject to degradation or obsolescence, the records system shall provide for conversion to a more stable medium. All records shall be stored in a manner that ensures their integrity, retrievability, and security.

### **772 Computerization of Records**

1. Records may be transferred to electronic storage data media provided certain precautions are taken to ensure that the information is maintained in a retrievable configuration.
2. Controls for the use and handling of electronic storage media should include the following:
  - a. A master index of documents on the storage medium
  - b. A program to ensure back-up and retrievability of information
  - c. Prevention of unauthorized manipulation of data
  - d. Assurance that previously stored information is retrievable and usable after system modifications.
3. Optical disks and other storage media may be used to archive records if the media satisfy the following:
  - a. A reliable system to prevent overwriting or erasure of records
  - b. Software and user controls consistent with Article 772.2
  - c. Manufacturer recommendations relating to software control, disk life expectancy, environmental storage conditions and maintenance are incorporated into policies and procedures governing government archiving.

### **773 Retention**

1. 10 CFR 835 and DOE Orders pertaining to records retention practices describe procedures for retaining records. The generic records retention policies are embodied in the Fermilab Records Management Policies and Procedures.
2. Once a record has been created, reviewed and signed by appropriate supervision, the record is considered complete and shall not be modified. Subsequent errors identified in a completed record may be corrected by creating a supplemental record that includes traceability for the correction.
3. Upon cessation of activities that could result in occupational exposure of an individual, all individual monitoring records shall be transferred to DOE.

#### **774 Physical Protection of Records**

1. Methods for protecting documents should be consistent with the requirements of DOE records retention requirements.
2. Storage arrangements should address physical damage that could be caused by temperature extremes, moisture, infestation, electromagnetic fields, excessive light, stacking, theft, fire, and vandalism.



## PART 8 RADIOLOGICAL REPORTING

### 781 Reports to Individuals

1. Each individual who is monitored is provided a written radiation dosimetry report at least annually. This report shall include:
  - the name of the individual;
  - the individuals Social Security Number, when available, or equivalent identifying number
  - the monitoring period; and
  - the total dose equivalent or effective dose for the monitoring period.
2. Consistent with the provisions of the Privacy Act, upon written request to the Dosimetry Program Manager, an individual will be provided detailed information concerning his/her dosimetry history.
3. When an exposure of an individual to radiation and/or radioactive material is above the established administrative goals and/or dose limits or is a planned special exposure and Fermilab is required to report to DOE, Fermilab shall also provide the affected individual with the dosimetry data included in the report.
4. Upon written request from an individual terminating employment, a summary of dose received during the period of employment shall be provided to that individual as soon as the data are available, but no later than 90 days after termination. Requests received after the individual has left the site will be honored within 90 days from date the request is received by the Dosimetry Program Manager. A written estimate of the radiation dose received by that employee based on available information shall be provided at the time of termination, if requested.

### 782 Reports Required by the U. S. Department of Energy

1. Reporting of Ionizing Radiation Exposure Information shall be reported in accordance with the requirements of DOE Order 231.1B, *Environment, Safety, and Health Reporting* as specified in its companion Contractor Requirements Document and Attachments.
2. Reporting of Radioactive Sealed Sources Information shall be reported to the DOE Radiological Source Registry and Tracking (RSRT) database in accordance with the requirements of DOE Order 231.1B, *Environment, Safety, and Health Reporting* as specified in its companion Contractor Requirements Document and Attachments.