DEPARTMENT OF ENERGY

10 CFR Part 835

[Docket No. EH–RM–96–835]

RIN 1901–AA59

Occupational Radiation Protection

AGENCY: Department of Energy.

ACTION: Notice of proposed rulemaking and public hearings.

SUMMARY: The Department of Energy (DOE) is proposing to amend its primary standards for occupational radiation protection. This proposed rule amendment is the culmination of a systematic analysis to identify the elements of a comprehensive radiation protection program and determine those elements of such a program that should be codified. As a result of this analysis, DOE proposes amendments to all of the subparts of 10 CFR part 835. The analysis included a review of the requirements in DOE Notice 441.1, ''Radiological Protection for DOE Activities,'' (extended by DOE N 441.2) that resulted in the proposed codification of certain provisions of that Notice, including requirements for posting of areas where radioactive material is present and for control of sealed radioactive sources. Several additional changes are proposed to ensure continuity in DOE's system of radiation protection standards by codifying in part 835 critical provisions of the ''DOE Radiological Control Manual'' (Manual), which is no longer a mandatory standard. DOE also proposes to explicitly exclude from part 835 radioactive material transportation conducted in compliance with applicable DOE Orders and certain activities conducted on foreign soil.

DATES: Written comments must be received by DOE by February 21, 1997 to ensure consideration. In addition, a computer disk containing the comments in WordPerfect 5.0 or later or as an ASCII file would be greatly appreciated. DOE has scheduled two public hearings to encourage public participation through oral comments on the proposed amendment. (Section III of this notice discusses some of the issues on which DOE would encourage the public to comment.)

1. Las Vegas, NV—January 22, 1997, beginning at 9:00 am (PST)
2. Washington, DC—February 6, 1997, beginning at 9:00 am (EST)

Requests to speak at a hearing should be received no later than 4:00 pm, January 17, for the Las Vegas hearing and February 4 for the Washington, DC hearing, (202) 586–3012.

ADDRESSES: The hearings will be held at the following addresses:

Las Vegas, NV—DOE Nevada Operations Office Auditorium, 2753 South Highland Drive

Washington, DC—U.S. Department of Energy, 1000 Independence Avenue, SW, Room 1E–245

Written comments (5 copies and a computer disk) and requests to speak at a hearing should be submitted to Dr. Joel Rabovsky, U.S. Department of Energy, EH–52, ''EH–RM–96–835 Rulemaking,'' 1000 Independence Avenue, SW, Washington, DC 20585, telephone (202) 586–3012. Comments may also be submitted electronically to the following address—http://tis-nt.eh.doe.gov/wpphm/835/835.htm. Such comments are subject to the same submittal deadline as that provided above for written comments.

Copies of the hearing transcripts, written or electronic comments received, and any other docket material received may be read and copied at the DOE Freedom of Information Reading Room, U.S. Department of Energy, Room 1E–190, 1000 Independence Avenue, SW, Washington, DC 20585, (202) 586–6020, between the hours of 8:30 a.m. and 4:00 p.m., Monday through Friday, except Federal holidays. The docket file material will be filed under ''EH–RM–96–835.'' DOE's analysis supporting the proposed amendment, including regulatory position papers providing detailed information on certain significant proposed changes, proposed revisions to DOE's Implementation Guides, accreditation program technical standards, a supporting Environmental Assessment, the DOE Radiological Control Standard, copies of the DOE Orders referenced herein, and a side-by side comparison of the existing rule and the proposed amendment may also be examined at this location.

For more information concerning public participation in this rulemaking proceeding, see Section III of this notice (Public Comment Procedures).

FOR FURTHER INFORMATION CONTACT: Dr. Joel Rabovsky, U.S. Department of Energy, Office of Worker Protection Programs and Hazards Management, EH–52, 1000 Independence Avenue, SW, Washington, DC 20585, (301) 903–2135.

For information concerning the public hearings and submission of comments, contact Andi Kasarsky, (202) 586–3012.

SUPPLEMENTARY INFORMATION:

I. Background

On December 14, 1993, DOE published a final rule, 10 CFR part 835, ''Occupational Radiation Protection'' (56 FR 64334). The rule codified certain requirements previously promulgated in DOE Order 5480.11, ''Radiation Protection for Occupational Workers,'' which implemented the ''Radiation Protection Guidance to Federal Agencies for Occupational Exposure'' (52 FR 2822) (Guidance to Federal Agencies), as well as guidance issued by authoritative organizations, including the National Council on Radiation Protection and Measurements (NCRP) and the International Commission on Radiological Protection (ICRP). In addition, the ''as low as reasonably achievable'' (ALARA) process was codified in 10 CFR part 835 as the primary means of maintaining occupational radiation doses below regulatory limits.

This Notice of Proposed Rulemaking would modify the scope of 10 CFR part 835 to explicitly exclude radioactive material transportation conducted in compliance with applicable DOE Orders and exclude certain activities conducted on foreign soil. DOE also proposes to add standards for area posting and sealed radioactive source control. In addition, DOE would add a removable surface radioactivity value for tritium, to be used to identify the need for area posting and imposition of certain radioactive material controls. DOE also proposes several revisions that would expand and clarify provisions of the rule to address radiation protection issues (1) identified through analysis of operational data and (2) which need to be added because of the elimination of the Manual as a mandatory standard. This proposed amendment would also clarify and correct minor errors in part 835.

The proposed changes to part 835 result from a critical evaluation of DOE's objectives for occupational radiation protection programs, including structured analyses of existing standards for similar programs, operational occurrences within the DOE complex, and provisions in the current rule. DOE also evaluated approaches used by national and international radiation protection organizations and experience DOE has gained since 10 CFR part 835 was issued. The results of

this evaluation are contained in an analysis supporting the proposed changes, ''Development of the 1996 Proposed Amendment to 10 CFR Part 835, *Occupational Radiation Protection*,'' (regulatory development document, November 1996) which may be viewed in the DOE Freedom of Information Reading Room at the address provided above.

In September 1995, DOE canceled DOE Order 5480.11, ''Radiation Protection for Occupational Workers,'' DOE Order 5480.15, ''Department of Energy Laboratory Accreditation Program for Personnel Dosimetry,'' and DOE Notice 5400.13, ''Sealed Radioactive Source Accountability,'' and eliminated the Manual as a mandatory standard. These actions were taken consistent with initiatives to reduce the overall burden of prescriptive and redundant requirements imposed through DOE's system of contractually-implemented directives. DOE selected and updated certain key provisions of the canceled Orders and the Manual and published them in DOE Notice 441.1. At that time, DOE indicated its intent to evaluate the importance of these elements and, based upon that evaluation, to codify those elements considered necessary for achievement of DOE's radiation protection objectives.

In general, the proposed amendments would codify requirements currently used within the DOE complex. DOE has determined that these requirements must be codified to assure that worker health and safety programs are maintained at a level commensurate with workplace hazards. These amendments would establish nuclear safety requirements that, if violated, would provide a basis for assessment by DOE of civil penalties under the Price-Anderson Amendments Act [1] (PAAA) of 1988.

Section 309 of the Department of Energy Organization Act (Pub. L. 95–91), Executive Order 12344, and Pub. L. 98–525 establish the responsibilities and authority of the Director, Naval Nuclear Propulsion Program, over all facilities and activities that comprise the Program, a joint Navy-DOE organization solely responsible for the military application of nuclear energy in connection with naval warship propulsion. Pursuant to the purpose and direction of these actions, the standards, regulations, and requirements prescribed by the Director continue to apply to Program facilities and activities in lieu of the regulations in this part.

[1] Price-Anderson Amendments Act, Pub. L. 100–408, August 20, 1988.

The proposed rule would establish a schedule for implementation of final amendments to 10 CFR part 835 as follows. The final rule would become effective 30 days following publication in the Federal Register. As provided in § 835.101(h), updated radiation protection programs (RPPs) would be due to DOE within 180 days following the effective date of the final rule. Changes that do not decrease the effectiveness of the RPP could be implemented immediately. As further provided in § 835.101(j), DOE would undertake efforts to approve all RPP changes within 180 days of submittal. In § 835.101(f), DOE has proposed provisions requiring full compliance with the regulatory changes (except for radiobioassay program accreditation) within 180 days of RPP approval. Because of the breadth of the joint DOE/DOE contractor effort needed to accomplish the proposed accreditation of radiobioassay programs, DOE proposes an implementation schedule of approximately three years for compliance with radiobioassay program accreditation requirements. Based on the expected duration of the public comment and comment resolution periods, in the proposed rule, DOE has proposed January 1, 2000 as the compliance date for the radiobioassay program accreditation requirements. DOE may change this compliance date in the final rule to reflect unforeseen changes in the rulemaking schedule or public comments addressing this proposal.

II. Proposed Actions and Analysis

A. Exclusions from 10 CFR Part 835

Radioactive Material Transportation

To avoid dual regulation of certain activities, DOE has excluded in § 835.1(b)(1) those activities that are regulated through a license by the U.S. Nuclear Regulatory Commission (NRC) or a State under an Agreement with the NRC, and activities certified by the NRC under section 1701 of the Atomic Energy Act. Although addressed in the preamble to the final rule (see 58 FR 65465), transportation of radioactive material conducted in compliance with applicable DOE requirements was not excluded from the scope of part 835, as originally adopted.

DOE standards for packaging and transporting radioactive material are addressed in various DOE Orders and were never intended to be covered by 10 CFR part 835. DOE Orders 460.1, ''Packaging and Transportation Safety,'' and 460.2, ''Departmental Materials Transportation and Packaging Management,'' provide DOE standards related to packaging and transportation of radioactive material. Requirements for radioactive material transported under DOE's national security mission are provided in DOE Order 5610.12, ''Packaging and Offsite Transportation of Nuclear Components and Special Assemblies Associated with the Nuclear Explosive and Weapon Safety Program,'' and DOE Order 5610.14, ''Transportation Safeguards System Program Operations.'' The requirements of these Orders are consistent with Department of Transportation (DOT) regulatory requirements and provide a more appropriate framework for ensuring transportation safety than 10 CFR part 835. Certain provisions of 10 CFR part 835 complement these transportation safety directives by ensuring that individuals are afforded an adequate level of radiation protection while preparing radioactive materials for, and receiving radioactive materials from, transportation. Consistent with its original intent, as expressed in the preamble to the final rule, DOE proposes to add an exclusion to § 835.1(b) for radioactive material transportation conducted in compliance with applicable DOE Orders.

DOE proposes to add a definition of ''radioactive material transportation'' in § 835.2(a) to clarify the distinction between the process of transporting radioactive materials, which would be excluded from 10 CFR part 835, and those activities leading to or resulting from radioactive material transportation, which are subject to 10 CFR part 835.

DOE recognizes that questions may arise with regard to when a package of radioactive material may be considered to be in transportation and subject to transportation safety requirements. Due to the wide range of affected activities and facilities, DOE does not believe that it can foresee and prescribe detailed requirements for all possible scenarios under which radioactive materials may be shipped from and received at its facilities. The initiation and termination of transportation activities are commonly documented by signature of the transport worker and shipping/receiving facility representative on a shipping manifest or other transportation document. DOE believes that these formal changes of custody ordinarily should be used to determine when material is in transport. DOE has published suitable guidance in the Manual and expects that corresponding facility-specific requirements will be included in the RPPs developed to ensure compliance with the final rule. Many documented RPPs already reflect such facility-specific requirements.

DOE Activities Conducted on Foreign Soil

Questions have arisen regarding the applicability of 10 CFR part 835 to the conduct of certain DOE activities on foreign soil outside the jurisdiction of the United States government. DOE proposes to add an exclusion to § 835.1(b) to recognize the primacy of foreign governments' occupational radiation protection requirements when such requirements have been agreed to by the United States.

Nuclear Explosives and Weapons Safety Program

DOE proposes to clarify the nuclear weapons program exclusion in § 835.1(b)(3) so that it clearly applies only to the extent that compliance with 10 CFR part 835 would compromise the effectiveness of activities essential to prevention of an accidental or unauthorized detonation. This provides the necessary flexibility to ensure implementation of programs that realize the overriding goal of preventing such incidents. The appropriate application of this exclusion is highly dependent upon activity-specific conditions which turn on issues of professional judgment. DOE expects that appropriate measures to implement this exclusion would be included in the RPPs developed to ensure compliance with the rule.

Applicability of Occupational Dose Received from Excluded Activities

DOE proposes to add § 835.1(c) to clearly provide that, even though certain activities are excluded from the scope of the rule, occupational doses received as a result of excluded activities apply toward determination of compliance with the yearly occupational dose limits established in subpart C. However, radiation doses excluded by proposed § 835.1(b)(6) (i.e., radiation doses from background radiation, as a patient for the purposes of medical diagnosis or therapy, and from participation as a subject in medical research programs) are not considered occupational doses and would not be considered in determining compliance with the occupational dose limits. Radiation doses resulting from planned special exposures and authorized emergency actions, whether within DOE facilities or facilities operated under the auspices of other regulatory agencies, also would not be considered in determining compliance with the occupational dose limits. See Section II.E. of this notice, ''Limitation of Occupational Doses,'' for further discussion of this issue.

B. Radiological Hazard Warning and Area Entry Control

Area Posting Requirements

DOE proposes several changes to simplify requirements for area posting and provide additional flexibility in implementing these requirements. Section 835.601(a) would be revised to clearly indicate that posting of radiological areas is required, regardless of the activities taking place in the area. The existing requirement refers to ''working areas,'' which does not clearly establish the need for posting all accessible areas meeting the radiological area and controlled area definitions of § 835.2(a). The requirement in § 835.601(b) for DOE approval of radiological warning signs and labels would be deleted because the nature and content of the prescribed radiological warning signs and labels are adequately described in §§ 835.601, 835.603, and 835.605. DOE proposes to revise § 835.601(b) to include the requirement for the standard radiation warning trefoil (previously referred to less precisely as the ''radiation symbol'') to be included on the required postings and labels. Formats for warning signs and labels that meet the requirements of § 835.601 are described in Implementation Guide G–10 CFR 835/G1, ''Posting and Labeling for Radiological Control.''

DOE also proposes to revise § 835.601(e) (redesignated as § 835.601(d)) to address both posting and labeling in privately-owned homes and businesses and to make the provision applicable to all of subpart G, not only § 835.601. DOE proposes to simplify the language in § 835.602(a) for clarity and to avoid conflict with the flexibility provided in § 835.602(b). In § 835.603, revisions to paragraphs (a) through (f) are proposed to eliminate redundancy with the definitions in § 835.2(a). Consistent with NRC requirements published in § 20.1902 of 10 CFR part 20, ''Standards for Protection Against Radiation,'' DOE proposes to allow use of the words ''Caution'' or ''Danger'' on postings for high radiation, high contamination, radioactive material, and airborne radioactivity areas.

For consistency with the preceding proposed changes, DOE proposes to revise the § 835.2(a) definitions of ''airborne radioactivity area,'' ''contamination area,'' and ''high contamination area'' to include accessibility provisions, consistent with the existing definitions of ''radiation area,'' ''high radiation area,'' and ''very high radiation area.''

DOE also proposes to add § 835.604 delineating specific exceptions to all of the radiological area posting requirements of § 835.603. These exceptions are proposed because DOE recognizes that compensatory measures may be implemented that would obviate the need for area posting. The radiological area posting exceptions would not apply to the radiological area entry controls established in §§ 835.501 and 835.502 or to the training requirements of § 835.901. The exceptions proposed in § 835.604 are similar to those established by the NRC in 10 CFR 20.1903.

Radioactive Material Area Posting

DOE Notice 441.1 (extended by DOE Notice 441.2) requires posting of areas where quantities of radioactive materials exceed specified threshold values. DOE considers this posting important, particularly to provide adequate warning to general employees who do not have the requisite training to enter these areas. DOE also notes that the NRC imposes similar requirements on its licensees in 10 CFR 20.1902. To codify these requirements, DOE proposes to define ''radioactive material area'' and include this term in the definition of ''radiological area'' in § 835.2(a), and to establish requirements for posting radioactive material areas in § 835.603(g). Posting would be required at each access point to any area accessible to individuals where containers or items of radioactive materials are present in quantities exceeding 10 times the values established in the proposed appendix E. Consistent with the requirements for other radiological areas, entry into radioactive material areas would also be subject to the entry control measures established in § 835.501 and the radiation safety training requirements of § 835.901. DOE proposes to add, in § 835.604(b), certain exceptions to the radioactive material area posting requirement.

Contamination Area Postings

Experience in implementing the provisions of the Manual has revealed an opportunity to simplify DOE requirements for posting and control of areas with surface contamination that exceeds the values listed in appendix D to 10 CFR part 835. DOE's primary purpose in establishing requirements for radiological area postings is to provide information sufficient to elicit an appropriate protective response from affected individuals. Under the current provisions of § 835.603, no distinction is made between the required postings for areas having only fixed surface

contamination and those having removable surface contamination, even though the hazards and desired protective responses are quite different. DOE proposes to revise the § 835.2(a) definitions of ''contamination area'' and ''high contamination area'' to be based upon removable surface contamination levels only.

Under § 835.404(d), surfaces located outside of radiological areas bearing total (fixed plus removable) surface contamination in excess of appendix D values, but removable surface contamination less than appendix D values, would continue to be subject to distinct marking and routine survey requirements to minimize the chance of inadvertent removal or disturbance of the radioactive material. However, unless the fixed contamination creates radiation levels sufficient to warrant posting for external radiation hazards, these areas would not be considered radiological areas and would be excepted from the radiological area posting and entry control requirements.

Radioactive Material Labeling

General requirements for radioactive material labeling are currently provided in § 835.601(a). These requirements were supplemented by detailed provisions in the Manual. To ensure that appropriate requirements for radioactive material labeling remain in effect, DOE proposes to add § 835.605 which would impose requirements for labeling items and containers of radioactive materials, with appropriate exceptions being proposed in § 835.606. These provisions are similar to the provisions in the Manual and requirements imposed by the NRC in 10 CFR 20.1904 and 20.1905. Related to this change, DOE proposes to add § 835.1101(d) requiring the removal of labels prior to releasing materials and equipment from radiological areas in accordance with § 835.1101(a). To consolidate recordkeeping requirements, DOE proposes to move the existing requirements of § 835.1101(d) to § 835.703(c). DOE also proposes minor format and language revisions to § 835.1101 to clarify its intent.

Surface Radioactivity Value for Tritium

When 10 CFR part 835 was published for public comment on December 9, 1991, the surface radioactivity values for tritium were not included in appendix D because DOE was in the process of determining appropriate values. An appropriate value for removable tritium surface radioactivity, consistent with the value published in the Manual, was identified during the public comment period of the original proposed rule. Public comments suggested a value consistent with the value now being proposed, but DOE determined that this value should not be included in the final rule because public comments had not been invited on this issue. Reopening the public comment period on this issue would have delayed publication of the final rule.

DOE has determined that a value for total (fixed plus removable) tritium surface contamination is inappropriate. Fixed tritium surface contamination presents no likely occupational exposure hazard and few practical technologies are available to facilitate field measurements. Therefore, DOE is not proposing a total surface radioactivity value for tritium. The basis for this decision is explained in more detail in the Environmental Assessment published concurrent with this proposed rule. To address these issues, DOE proposes to amend appendix D to 10 CFR part 835 by adding a removable surface radioactivity value of 10,000 disintegrations per minute per 100 square centimeters and adding footnote 6 to discuss tritium that has migrated into the surface in question. The tritium surface radioactivity value is used to determine the applicability of the area posting requirements of § 835.603 and the radioactive material control requirements of § 835.1101.

Radiological Area Entry Control

Section 835.501 currently establishes only general requirements for administrative control of radiological work. As documented in the regulatory development document, analysis of operational occurrences throughout the DOE complex indicates that a significant portion of radiation protection-related occurrences result from inadequate work control. Therefore, DOE proposes more detailed provisions for written work authorizations in § 835.501(e). DOE expects that these provisions would be implemented through a system that imposes progressively more specific and limiting written control mechanisms as the potential radiological hazards and complexity of requisite controls increase. For instance, requirements for tours or limited work in low hazard areas may be specified in generally applicable procedures, while requirements for higher hazard work may be specified in short-term technical documents requiring pre-job briefings and worker acknowledgment of specific work controls. This approach is consistent with that previously specified in the Manual. The proposed amendment provides substantial flexibility for implementation on a facility- and hazard-specific basis.

DOE proposes to revise § 835.502 to add measures for control of access to high radiation areas where an individual may receive a deep dose equivalent exceeding 0.1 rem (0.001 sievert) in one hour. These requirements supplement the existing requirements (proposed for redesignation as § 835.502(b)) for areas where an individual might receive a deep dose equivalent exceeding 1 rem in one hour. The proposed control measures include requirements for use of a supplemental dosimetry device and appropriate area surveys. These requirements are similar to those implemented by DOE facilities in accordance with the Manual and are consistent with the DOE ALARA process. The NRC has imposed similar requirements on its commercial reactor facility licensees. DOE proposes to revise the heading of § 835.502(b) to reflect its content. DOE also proposes to revise the text of proposed § 835.502(b) to replace the undefined term ''personnel'' with the defined term ''individual,'' and to delete the reference to the posting requirements for very high radiation areas from proposed § 835.502(c). These conditions are adequately described in the definition of ''very high radiation area'' in § 835.2(a).

C. Control of Sealed Radioactive Sources

In promulgating 10 CFR part 835, DOE stated that it would codify sealed radioactive source control requirements in subsequent rulemakings. DOE Notice 5400.9, ''Sealed Radioactive Source Accountability'' (extended through DOE Notice 5400.13), established requirements for control of sealed radioactive sources. The requirements in DOE Notice 5400.9 were eventually superseded by those in DOE Notice 441.1. DOE now proposes to include certain of the requirements from DOE Notices 5400.9 and 441.1 in 10 CFR part 835.

DOE proposes to add requirements for sealed radioactive source control in §§ 835.1201 and 835.1202. For sealed radioactive sources meeting the definition of ''accountable sealed radioactive source'' proposed in § 835.2(a) and the accountability criteria proposed in appendix E, the proposed amendment would require written procedures for source control, including labeling, inventory, leak testing, and recordkeeping. Accountable sealed radioactive source inventory and leak testing would be required at least every six months, with exceptions from the source leak testing requirements

established for sources that are either inaccessible or out of service.

DOE determined the proposed accountability values as follows. For each radionuclide, DOE calculated two values: (1) the activity that would result in a deep dose equivalent from external radiation of 0.01 rem (0.0001 sievert) in a year assuming an individual was irradiated continuously at a distance of 1 meter from the source; and (2) the activity that would result in a committed effective dose equivalent of 0.01 rem (0.0001 sievert) assuming that an intake of 1% of the material by an individual occurred during the incident. DOE compared the external and internal dose values and selected the more conservative value as the basis for the accountability value. The selected values were subsequently rounded to facilitate grouping in appendix E. The 0.01 rem value supports DOE requirements found in DOE Order 5400.5, ''Radiation Protection of the Public and the Environment,'' for reporting doses to members of the public in excess of that value.

DOE proposes related changes to definitions and recordkeeping requirements in §§ 835.2(a) and 835.704(f), respectively. The terms that would be added to § 835.2(a) are ''accountable sealed radioactive source,'' ''sealed radioactive source,'' and ''source leak test.''

D. Workplace Monitoring and Determination of Individual Doses

Use of the Terms ''Monitor'' and ''Survey''

In reviewing the requirements of 10 CFR part 835, DOE noted that the terms ''monitor'' and ''survey'' are not consistently used. DOE is proposing changes to the definition of the term ''monitoring'' in § 835.2(a) that more clearly establish that ''monitoring'' involves measurement of radiological conditions and the subsequent use of the results of these measurements for evaluation of potential and actual doses. ''Survey,'' on the other hand, is more directly related to assessment of workplace or material radiological conditions through direct measurement, assessment, or calculation for the purposes of hazards assessment. DOE proposes changes throughout the rule to ensure consistent application of these terms.

DOE also noted that the requirements of § 835.403(b) are redundant with those established in § 835.401. Therefore, DOE proposes to delete § 835.403(b) and, consistent with this change, to change the heading of § 835.403 to reflect the content of that section. DOE also proposes to clarify the requirements of §§ 835.401(c) and 835.703(d) by making the calibration requirements apply to both ''instruments'' and ''equipment.'' DOE believes that this clarification is consistent with current field practice with regard to equipment, such as an air sampler, that, although incorporated into or associated with instrumentation systems, does not include any instrumentation.

Individual Monitoring and Dose Determination

In § 835.402 (b) and (d), DOE proposes to clarify the requirements for external and internal dose monitoring programs by providing that such programs must be capable of demonstrating compliance with all of the individual dose limits in subpart C. This revision is consistent with DOE's previously established requirements for records required under § 835.701(a). DOE recognizes that, in some cases, individual monitoring programs (i.e., external dosimetry and radiobioassay) may not be capable of quantifying doses at levels near the monitoring thresholds established in § 835.402. In these instances, DOE expects that a combination of individual and workplace monitoring would be used to assure compliance with these monitoring thresholds. This monitoring may include calculational or statistical methods (such as the conversion of derived air concentration (DAC)-hours to calculated doses).

Recent occurrences have revealed weaknesses in certain radiobioassay programs implemented at DOE facilities. To enhance the integrity of radiobioassay programs and prevent recurrence of these adverse events, DOE proposes to amend § 835.402(d) to require program accreditation through the recently developed DOE Laboratory Accreditation Program (DOELAP) for Radiobioassay or demonstration of equivalent performance. These proposed requirements are analogous to existing DOE requirements for accreditation of external dosimetry programs. Proposed § 835.402(e) provides that the Secretarial Officer responsible for environment, safety and health matters (currently the Assistant Secretary for Environment, Safety and Health) may authorize alternatives to the DOELAP accreditation process for programs whose performance is demonstrated to be equivalent to that of accredited programs.

DOE also proposes in § 835.402(e) to require programs to conform to the most recent revisions of the DOELAP technical standards or be subject to review and approval of the Secretarial Officer responsible for environment, safety and health matters. These provisions will ensure that, to the extent practicable, DOE radiation protection programs continue to reflect the latest advances in the sciences of external and internal dosimetry. Language will be included in the DOELAP technical standards to indicate that changes in the standards become effective only during the next scheduled accreditation cycle. This will prevent the automatic loss of accreditation status as a result of changes to the DOELAP technical standards.

DOE has also proposed to update the external dosimetry program accreditation requirements, provided in § 835.402(b), to reflect the program features for radiobioassay program accreditation discussed above. These proposed changes would not affect the compliance status of dosimetry programs currently accredited, or excepted from accreditation, under the existing DOELAP standards.

Implementing standards for DOELAP are published in a DOE Technical Standard, ''Department of Energy Laboratory Accreditation Program Administration'' (a standard number will be assigned when the standard is completed). This standard provides requirements for administration of DOE's accreditation programs and cites the technical requirements provided in DOE–STD–1095–95 (for accreditation of personnel dosimetry programs) and a separate standard (a standard number will be assigned when the standard is completed) for accreditation of radiobioassay programs. The DOELAP technical standards may be reviewed at the DOE Freedom of Information Reading Room at the address provided above.

DOE also proposes to revise § 835.402 (b) and (d) to clearly indicate that program accreditation requirements apply only to personnel dosimetry and radiobioassay programs implemented to demonstrate compliance with § 835.402 (i.e., monitoring when doses are likely to exceed the stated thresholds). DOE recognizes that many DOE activities conduct stringent monitoring programs for individuals even when those individuals are not expected to receive doses exceeding the applicable monitoring thresholds in §§ 835.402. However, DOE believes that it is inappropriate to impose, through regulation, accreditation requirements upon monitoring programs that are not required by regulation. Existing regulatory provisions in § 835.402 (a) and (c) would continue to require individual monitoring for all individuals likely to receive a dose equivalent exceeding the applicable

thresholds. Measures used to identify individuals likely to receive doses exceeding the thresholds should include comprehensive, documented workplace surveys and could include, if management so chooses, individual monitoring. As required by § 835.701(a), the monitoring and survey results must be documented.

In a related change, because DOELAP for Personnel Dosimetry provides appropriate dosimetry system performance criteria, DOE proposes to delete the dosimeter calibration requirement from § 835.402(b).

DOE proposes to revise the § 835.402(a)(3) and (c)(3) monitoring requirements for minors by expressly stating that these requirements apply to occupationally exposed minors only. Minors who are not occupationally exposed are subject to the member of the public monitoring requirements found in § 835.402(a)(4) and (c)(4). Doses received by a minor as a member of the public entering the controlled area would not be included in any occupational dose received. DOE also proposes to revise the member of the public monitoring requirements by clarifying that these requirements apply only to members of the public while inside the controlled area of a DOE site or facility. Individuals who enter a controlled area without entering radiological areas are not expected to receive a total effective dose equivalent exceeding 0.1 rem in a year.

DOE proposes to delete from § 835.402(c)(1) the individual monitoring threshold for organs and tissues based upon committed dose equivalent. DOE has determined that the threshold based upon committed effective dose equivalent, also provided in § 835.402(c)(1), provides an equivalent or more restrictive basis for monitoring. A technical correction is proposed to § 835.402(a)(1)(i) to require individual monitoring on the basis of deep dose equivalent rather than effective dose equivalent because deep dose equivalent is the parameter actually monitored by existing dosimetry programs. DOE also proposes to delete § 835.402(a)(1)(iv) because any doses meeting this condition are adequately addressed by § 835.402(a)(1)(i).

Use of Appendices

To clarify application of the data presented in the appendices to 10 CFR part 835, DOE proposes to add introductory text to each appendix providing references to those sections of the rule requiring use of the appendix.

DOE has determined that 10 CFR part 835 establishes no substantive requirements for use of the data presented in appendix B, and therefore proposes to delete appendix B. The correlation of chemical form to lung retention class is available directly from Table 3 of Federal Guidance Report Number 11, ''Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion.'' DOE also proposes to delete the absorption factor (f_1) values and the related footnote (Footnote 5) from appendix A to part 835. The absorption factors and alternative absorption factors are neither used nor referenced in the rule.

DOE's review of exemption requests concerning occupational exposure to radon and thoron and their daughter products revealed that air immersion DAC values for Rn-220 and Rn-222 are not appropriate. Therefore, DOE proposes to delete the air immersion DAC values for Rn-220 and Rn-222 from appendix C. Experience in implementing 10 CFR part 835 has proven that the exposure conditions used to determine the appendix C DAC values (immersion in a semi-infinite cloud) often differ from those at DOE facilities (i.e., exposure in relatively small enclosures). Use of the appendix C DAC values under these conditions can result in a gross over-estimation of individual doses. In appendix C, DOE proposes to allow modifications to the DAC values to compensate for immersion in a cloud of finite dimensions and to provide instructions for determining the DAC of a mixture of radionuclides.

Workplace Air Monitoring

Section 835.403 establishes requirements for monitoring the concentrations of radioactive material in the ambient air of the workplace, emphasizing use of real-time air monitors. These requirements are augmented by §§ 835.209 and 835.402 which establish requirements for determining internal doses through radiobioassay except under specific conditions. Despite these codified requirements, DOE has noted a number of recent occurrences indicating significant problems in air monitoring and internal dose evaluation programs. To address these problems, DOE proposes to amend § 835.403 to establish more practical and technically correct criteria for the use of real-time air monitors, based upon potential releases that would exceed defined threshold exposure levels. DOE would also require air sampling when respiratory protective devices are prescribed to protect individuals from exposure to airborne radionuclides. This latter provision addresses recent occurrences at DOE facilities reflecting a need for more stringent controls and is consistent with requirements imposed by both the NRC and the Occupational Safety and Health Administration (OSHA) (see 10 CFR 20.1703(a)(3) and 29 CFR part 1910, ''Occupational Safety and Health Standards,'' § 1910.134(a)(8), respectively).

DOE proposes to base air sampling criteria upon likely exposure to a threshold value of DAC-hours in a year, rather than the existing criterion based upon a percentage of the annual limit of intake. The established values are equivalent; this change would simply reflect the provision of data in the referenced appendices (A and C) in units of DAC values and will eliminate the need for field calculations and inherent mathematical rounding errors. DOE proposes to add to § 835.2(a) definitions for the terms ''derived air concentration-hour (DAC-hour),'' ''real-time air monitoring,'' ''respiratory protective device,'' and ''week,'' which are used in § 835.403. In addition, DOE proposes to delete the definitions of ''ambient air'' and ''continuous air monitor'' because these terms would no longer be used in part 835.

DOE has also determined that the requirements for use of DAC values in § 835.209(b) are redundant and therefore proposes to delete this provision.

Receipt of Radioactive Material Packages

DOE currently establishes no substantive requirements for receipt of packages containing radioactive material and is concerned with the frequency of occurrences involving packages that were not shipped in accordance with DOT requirements and corresponding DOE Orders. DOE proposes to add § 835.405 to ensure adequate protection of individuals, such as warehouse and office workers, who may be exposed to such materials after transport. The proposed provisions include requirements for receiving radioactive material packages from transport and performing radiological surveys of these packages. The proposed requirements are similar to NRC requirements in 10 CFR 20.1906.

E. Limitation of Occupational Doses

Occupational Dose Limits

Section 835.202(b) requires that all occupational doses received during the current year be included when demonstrating compliance with the occupational dose limits in § 835.202(a). This requirement is consistent with the

recommendation made in the Guidance to Federal Agencies. However, the Guidance to Federal Agencies also indicates that the numerical values (dose limits) do not apply to workers responsible for emergency management and response situations and that the cognizant agency may make provisions for exceeding the numerical values during emergencies and other unusual situations. DOE has made such provisions in §§ 835.1301 and 835.1302 for emergency situations and in § 835.204 for planned special exposures. Therefore, DOE proposes to add the phrase ''from all occupational doses'' in § 835.202(a), delete the phrase ''resulting from DOE activities'' in the heading of § 835.203 and clearly state these exceptions in § 835.202(b), to clarify that all occupational doses received during the year, except those resulting from planned special exposures and emergency exposures, shall be included when demonstrating compliance with the occupational dose limits in § 835.202(a).

In § 835.207, DOE proposes to clarify that the limits apply to doses resulting from occupational exposure only and to add deterministic dose limits for minors consistent with the Guidance to Federal Agencies. Non-occupational exposure of minors is subject to the dose limits established in § 835.208 for members of the public entering a controlled area. In a related change, DOE would revise the definition of ''member of the public'' in § 835.2(a) to clearly distinguish members of the public from temporary or transient workers or visiting scientists, who could receive occupational doses. DOE would also revise § 835.208 to unambiguously state that the member of the public dose limit applies to members of the public in the controlled area only.

DOE also proposes to revise the definition of ''cumulative total effective dose equivalent'' (CTEDE) in § 835.2(b). The current definition includes only those total effective dose equivalent (TEDE) values from a specific DOE site or facility from January 1, 1989. The proposed revision would include all available TEDE values from January 1, 1989, whether or not the dose was received at that DOE site or facility. DOE recognizes that records of CTEDE may not be available for all individuals due to differences between DOE requirements and those of other regulatory agencies. However, it is DOE's expectation that, consistent with the requirements previously imposed through DOE Order 5480.11 and the Manual, TEDE values will be available for all individuals who have received occupational dose at DOE and DOE contractor facilities since January 1, 1989.

Planned Special Exposures

Section 835.204 establishes requirements for authorizing, conducting, and reporting planned special exposures which result from planned operations and may result in doses exceeding the occupational dose limits established in § 835.202. Upon reexamination of these requirements, DOE notes that, unlike NRC requirements, no provisions have been made for authorizing planned special exposures in excess of the deterministic dose limits established in § 835.202. To provide for the maximum reasonable flexibility on the part of its contractors, DOE proposes to amend § 835.204 to establish such provisions consistent with the NRC's requirements at 10 CFR 20.1206.

DOE also proposes to amend §§ 835.2(a) (definition of the term ''occupational dose'') and 835.202(a) to clearly indicate that doses resulting from planned special exposures are considered occupational doses which would be documented in an individual's occupational dose record, but would not apply toward determination of compliance with the occupational dose limits in § 835.202. In a related change, DOE proposes to change the word ''and'' to ''or'' in § 835.204(c)(1) to clarify that the annual and cumulative dose limitations apply independently. DOE also proposes to revise § 835.204(c) to indicate that doses resulting from planned special exposures may exceed the numerical values established in § 835.202 without actually exceeding the occupational dose limits. Finally, DOE proposes to clarify the § 835.204(d) documentation requirements for planned special exposures.

Design and Control

Experience in implementing the provisions of 10 CFR 835 has revealed that the design objectives currently included in § 835.1002 (b) and (c) may not be practical in development of modifications to existing facilities. Because the provisions of § 835.1001 adequately address DOE's facility design objectives, DOE proposes to delete § 835.1002 (b) and (c). DOE expects that these performance objectives would be utilized to the extent practical in the design and modification of facilities and DOE will include these objectives in guidance documents. DOE also proposes to move the remaining requirements in paragraphs (a) and (d) of § 835.1002 to § 835.1001.

The design criteria established in § 835.1003(a) do not include the lens of the eye dose limit established in § 835.202(a)(3). This omission creates an inference that the design of new facilities or modification of existing facilities can include design features that would result in doses exceeding the lens of the eye dose equivalent limit of 15 rem. DOE proposes to correct this omission by including all applicable occupational dose limits in this section.

Accident and Emergency Exposures

DOE proposes several corrections and clarifications of the requirements for accident and emergency exposures to individuals. DOE proposes to correct § 835.1301(a), (b), and (d) by deleting the references to § 835.205, which provides no dose limits. Consistent with the proposed changes to § 835.204, DOE proposes to revise § 835.1301(a) to indicate that doses resulting from emergency exposures may exceed the numerical values established in § 835.202 without violating the occupational dose limits. Both accident and emergency doses would be considered occupational doses and included in a general employee's occupational dose record, but emergency doses would be explicitly excluded from consideration in determining compliance with the occupational dose limits in § 835.202(a).

Section 835.1302 provides guidelines for control of individual doses under emergency conditions. Although the heading of the table currently in § 835.1302 indicates that the stated values are ''guidelines,'' the text of the rule and the column heading in the table indicate that the dose values are regulatory limits. To eliminate this contradiction and allow for the uncertainties involved in emergency operations, DOE proposes to remove § 835.1302(d). These issues are adequately addressed in related DOE Orders and emergency management guides.

In § 835.1304, DOE proposes to substitute the defined term ''individual'' for the term ''personnel'' to eliminate confusion regarding the coverage of the personal nuclear accident dosimetry provisions. DOE also proposes to remove the reference to ''all personnel'' to provide flexibility in implementing the personal nuclear accident dosimetry provisions. The approach taken must be technically justifiable and documented accordingly.

F. Radiation Safety Training

Radiation safety training requirements for general employees, radiological workers, and radiological control

technicians are provided in subpart J of 10 CFR part 835. These requirements were previously augmented by the Manual, which established detailed training requirements based upon the hazards present in posted areas to which an individual might have unescorted access. DOE proposes to reformat §§ 835.901, 902, and 903 into one section to incorporate an approach similar to that previously published in the Manual and to eliminate redundancy.

The Manual required the use of standardized radiological control core courses [2] developed for training general employees, radiological workers, and radiological control technicians. DOE Notice 441.1 established a requirement to use those portions of these courses appropriate to facility hazards and operations. After considering public comments on the original rule, DOE determined that the detailed radiation safety training requirements in the Manual obviated the need to specify minimum training course content in 10 CFR part 835. Since the Manual has become non-mandatory, DOE now proposes to specify the minimum training course content requirements in § 835.901(b). In § 835.901(b), DOE also proposes to more broadly allow acceptance of previous radiation safety training received by an individual. These proposed provisions would ensure that all occupationally exposed individuals and unescorted individuals attain an appropriate level of radiation safety knowledge. The level of training required would be based upon the individual's prior training, potential for exposure to radiological hazards, and actual and anticipated assignments. DOE believes that this hierarchal approach will result in the appropriate level of knowledge for general employees, with a progressively higher level of knowledge required for radiological workers and radiological control technicians. This approach is consistent with field experience and feedback from DOE operating contractors and is similar to the approach taken by the NRC in 10 CFR part 19, ''Notices, Instructions and Reports to Workers: Inspection and Investigations.''

Field experience in implementing the existing training requirements of § 835.901 shows that little benefit is derived from requiring an examination upon completion of general employee radiological training. This is due to the limited training content and occupational exposure expectations for general employees who are not classified as radiological workers. Therefore, DOE proposes to eliminate the examination requirement for general employees who are not permitted unescorted access to radiological areas. Examinations would still be required for general employees who are permitted unescorted access to radiological areas and for radiological workers prior to performing unescorted assignments. DOE also proposes to add in § 835.901(f) specific requirements for individuals who may act as escorts of individuals who have not completed required training.

DOE proposes to add a definition of ''radiological control technician'' to § 835.2(a) to specifically identify the class of individuals subject to the radiological control technician training requirements. DOE also proposes to clarify in § 835.901(g) the requirements for retraining, which include examinations for radiological workers and radiological control technicians.

G. Individual Dose Records and Reports

Section 835.402 establishes requirements for monitoring individuals' exposures to radiation and radioactive materials. In concert with these requirements, § 835.702 establishes requirements for maintaining individual dose records, including records of doses that were determined, but not required to be monitored under § 835.402. To reduce the burden of recordkeeping and in keeping with the recommendations in the Guidance to Federal Agencies, DOE proposes to revise §§ 835.203(a) and 835.702(b) to provide that when monitoring is performed, but not required by § 835.402, internal and external doses must be summed and records must be maintained only if the doses determined by the non-mandatory monitoring exceed the thresholds of § 835.402. However, adequate records of workplace conditions, obtained through area monitoring and surveys, should be maintained to provide assurance that doses to unmonitored individuals remain below the monitoring thresholds. These records could be supplemented by records of individual monitoring performed, but not required by § 835.402. DOE is also proposing to revise § 835.702(c)(1) to provide that records must be sufficient to demonstrate compliance with all of the subpart C dose limits. This provision is consistent with § 835.701(a). DOE proposes to delete the words ''caused by contamination on the skin'' in § 835.702(b) to ensure consistency with the referenced requirements in § 835.205.

In § 835.702(c)(4)(iii), DOE proposes to eliminate the requirement to record the estimated intake associated with internal dose assessments. This change is proposed because determination of the estimated intake is not necessary for all radionuclides, such as tritium. The requirement for recording of the estimated intake was originally intended to facilitate reevaluation of internal doses at a later date. However, DOE has concluded that § 835.702(g) requires recording of sufficient information to allow future verification or reassessment of recorded doses.

Section 835.702(d) establishes requirements for obtaining records of an individual's previous occupational doses during the current year to facilitate demonstration of compliance with the occupational dose limits in § 835.202(a). Section 835.702(e) establishes similar requirements for records of prior years doses to facilitate compliance with requirements for determining each affected individual's cumulative total effective dose equivalent. DOE proposes to revise § 835.702 (d) and (e) such that acceptance of written estimates of an individual's prior occupational dose would be based upon an inability to obtain formal records, rather than the absence of those records. DOE also proposes to amend § 835.702(e) to clarify its requirements for obtaining records of previous years doses. Consistent with the Guidance to Federal Agencies, which discourages implementation of burdensome recordkeeping requirements for tracking of trivial doses, in § 835.702(e), DOE proposes to require historical record searches only for radiological workers monitored in accordance with § 835.402.

DOE proposes other technical and editorial changes to clarify the recordkeeping provisions and to ensure consistency with other changes proposed in subparts J and M of 10 CFR part 835. DOE also proposes to revise § 835.704(d) to require documentation of revocations of declarations of pregnancy.

Based on field experience and feedback from DOE operating contractors, DOE proposes to delete from § 835.4 the prohibition on use of the international radiological units. These units are commonly used for calculational and reference purposes and are included in records related to workplace conditions and individual doses. Except for these calculations or references, records required by 10 CFR part 835 would continue to be

[2] DOE/EH–0258T–1, General Employee Radiological Training and Radiological Worker Training, Program Management Manual, and DOE/EH–0262T–1, Radiological Control Technician, Training Program Management Manual, 1992.

maintained using the special units. Consistent with its historical endorsement of the special radiological units of curie, rad, and rem, DOE also proposes to specifically allow for use of subunits and multiples of the unit ''roentgen.''

Section 835.801(a) requires that individual dose reports contain the individual's social security number or employee number. Some individuals may not have a social security or employee number; therefore, DOE proposes to modify the text of the reporting requirements to allow the use of another unique identification number in these situations.

H. Corrections and Clarifications

DOE proposes editorial corrections and technical clarifications that do not change the requirements of the rule or the measures necessary to ensure regulatory compliance. Editorial changes correct the structure and format of certain sections of the rule. Technical clarifications improve the accuracy of certain provisions in the rule. These changes include: clarification of the definition and explanation of occupational dose in §§ 835.1(b)(6), 835.2(a), and 835.202(c); deletion of the definition of ''collective dose'' (§ 835.2(b)); and correction of the definitions of ''airborne radioactive material'', and ''year'' (§ 835.2(a)) and ''external dose or exposure,'' and ''quality factor'' (§ 835.2(b)). The definition of ''controlled area'' (§ 835.2(a)) has been modfied by deleting the second sentence ''Individuals who enter only the controlled area without entering radiological areas are not expected to receive a total effective dose equivalent of more than 100 mrem (0.001 sievert) in a year''. This sentence is not appropriate for the definition section and now follows the first sentence of § 835.602(a).

DOE proposes to clarify application of the mean quality factors for neutrons provided in § 835.2(b) by indicating that, when the neutron energy falls between the values provided in the table, the more conservative value must be used. DOE proposes to delete § 835.2(d) since the convention stated in that paragraph for the use of singular, plural, masculine, and feminine terms is not used in part 835.

Paragraphs (f) and (g) of § 835.101 include provisions for the initial development and approval of documented radiation protection programs. Because the operative dates in those paragraphs have passed, DOE proposes to revise paragraph (f) and to delete paragraph (g) to remove the obsolete requirements.

DOE proposes to clarify the required frequency of internal audits (§ 835.102), instrument calibration (§ 835.401), and radiation safety retraining (§ 835.901) from an established number of years to an equivalent number of months to avoid confusion caused by the dose limit-based definition of ''year'' provided in § 835.2(a). DOE also proposes to revise the requirements of § 835.102 for clarity.

DOE proposes to change the heading of § 835.202 to ''Occupational dose limits for general employees'' to accurately reflect the content of that section.

DOE proposes to delete from § 835.203(a) and the § 835.2(b) definition of ''total effective dose equivalent'' the provision related to substitution of deep dose equivalent for effective dose equivalent from external exposure. This provision is redundant with the revised definition of ''effective dose equivalent'' proposed in § 835.2(b).

DOE proposes to delete § 835.203(c), which allows the use of a weighting factor of unity (1) for determination of the effective dose equivalent under conditions of uniform external irradiation. This provision is redundant with the notes accompanying the weighting factor table in § 835.2(b).

DOE proposes to clarify the language in § 835.404(f) to more clearly address the role of contamination monitoring in the occupational radiation protection program.

DOE has also proposed a correction to the appendix D values for uranium surface radioactivity to indicate that these values apply to emitted alpha radiation only. This correction is consistent with the requirements previously imposed through the Manual. DOE is also proposing several minor clarifications of the footnotes to appendix D.

III. Public Comment Procedures

A. Participation in Rulemaking

DOE encourages the maximum level of public participation possible in this rulemaking. DOE urges interested parties to submit written comments and also encourages individuals to participate in the public hearings to be held at the times and places indicated at the beginning of this notice.

DOE has established a period of 60 days following publication of this notice for individuals to comment on this notice of proposed rulemaking. All public comments and the transcripts of public hearings and other docket material will be available for review in the DOE Freedom of Information Reading Room at the address given at the beginning of this notice. The docket file material will be filed under ''EH–RM–96–835.''

DOE is requesting comments on the proposed amendments to 10 CFR part 835, particularly with regard to the potential impact of the proposed amendments on the level of radiation protection afforded individuals affected by DOE activities. Where appropriate, comments should be supported by substantive technical and/or financial analyses and justifications to facilitate DOE's evaluation of the submitted comments. DOE particularly invites comments on the following issues and alternatives; however, comments need not be limited to these issues.

1. Transportation

DOE is proposing clarifications to the scope of 10 CFR part 835 with respect to activities involving transportation of radioactive materials, as discussed in Section II of this Supplementary Information section. DOE seeks public comment on the proposal and any other alternatives that members of the public would like DOE to consider.

2. Planned Special Exposures

DOE is proposing changes to the § 835.204 requirements for conduct of planned special exposures, including provisions for planned special exposures exceeding the values of the deterministic dose limits in § 835.202. Addition of deterministic dose limits would be consistent with provisions established by the NRC at 10 CFR 20.1206. However, DOE notes that planned special exposures have not been conducted and, in light of current activities and doses within the DOE complex, may not be warranted. DOE is therefore seeking comments on the possible impact of eliminating all of the planned special exposure provisions in § 835.204.

3. Sealed Radioactive Source Control

DOE invites comments regarding the sealed radioactive source accountability values proposed for inclusion as appendix E to 10 CFR part 835. The basis for these values is explained in detail in Section II.C. DOE has also selected a multiple of these values as the basis for identifying radioactive material areas as defined in § 835.2(a). DOE is interested in receiving public comments regarding other options for determining appropriate values and the technical bases supporting any proposed alternatives.

4. Radiation Safety Training

DOE is proposing changes to the radiation safety training requirements in subpart J. Due to the limited course content and exposure restrictions in controlled areas, DOE is proposing to eliminate the § 835.901 requirement for general employees to complete written examinations upon completion of general employee radiological training. DOE is interested in receiving comments regarding the impact of this change and possible benefits of retaining the requirement.

Consistent with the current requirements of 10 CFR part 835, DOE would retain radiation safety training requirements for three classes of individuals. The proposed requirements of § 835.901 (c) and (d) (analogous to current requirements of §§ 835.901 and 835.902, respectively) are based upon the radiological hazards in the areas to which unescorted access is permitted and the activities to be undertaken by individuals in these areas. However, the proposed requirements, while appropriate to the needs of general employees and radiological workers, may not adequately address the duties and responsibilities of radiological control technicians (RCTs). DOE is concerned about the efficacy of the proposed rule, as it would apply to RCTs, because: (1) the education, training, and responsibilities of RCTs throughout the DOE complex vary greatly; (2) the training course subject matter requirements proposed for inclusion in § 835.901(b) may not always be specifically related to the responsibilities of RCTs at the varied DOE facilities; (3) specification of explicit training requirements for RCTs may establish an inferred primacy for that position that is unwarranted in relation to the responsibilities of other individuals who fill various technical support, supervisory, and management positions; and (4) there are no requirements for any DOE activity to actually employ RCTs. Therefore, DOE is seeking public comment on the following alternative approaches and invites comments on any other viable approaches for ensuring that radiation safety training is provided in a manner sufficient to ensure adequate implementation of the radiation protection program.

4a. Alternative Approach 1

The first alternative approach under consideration would be to add to § 835.901 a separate paragraph that establishes specific RCT training course content requirements that reflect the wide range of duties and responsibilities of RCTs employed by DOE activities. This approach would, in effect, codify training course content distinctions that are currently established in the standardized core training courses distributed by DOE. For example such requirements might expand the training course content requirements of § 835.901(b) to more clearly indicate that, for RCTs, ''basic radiological fundamentals'' (§ 835.901(b)(2)) includes fundamentals of radiation detection and measurement theory and techniques and that ''individual responsibilities for implementing ALARA measures'' (§ 835.901(b)(5)) includes provisions for providing job-site radiation protection coverage for general employees.

4b. Alternative Approach 2

The second alternative approach under consideration would be to add to § 835.901 separate paragraphs that establish specific training requirements for RCTs and other key positions in the radiological control organization, e.g., radiological control manager, RCT supervisor, ALARA engineer, and radiological control support personnel.

4c. Alternative Approach 3

The third alternative approach under consideration would be to remove from 10 CFR part 835 all requirements for RCT training. This approach is based upon a presumption that compliance with the performance requirements established in 10 CFR part 835 provides for an adequate degree of radiation protection, regardless of the training provided to RCTs.

4d. Alternative Approach 4

The fourth alternative approach under consideration would be to remove the RCT training requirements from subpart J and add to § 835.101 a general requirement for individuals responsible for implementing the requirements of 10 CFR part 835 to have the appropriate education, training, and skills to effectively discharge these responsibilities.

5. Written Procedures

In reviewing the requirements of 10 CFR part 835 and the proposed amendment, DOE noted that various requirements for written procedures have been established without consistent consideration of the hazards involved in the wide range of DOE activities (see §§ 835.404(d), 835.405(f), 835.501(d), 835.1001(b), 835.1003(a), 835.1101 (b) and (c) and 835.1201(a)). For instance, proposed § 835.1201(a) establishes requirements for written procedures for control of accountable sealed radioactive sources, regardless of their activity, but there is no parallel requirement for control of planned special exposures. DOE is concerned that this inconsistency, while historically present under DOE Order 5480.11, may divert resources from active management of high-risk activities to administrative control of low-risk activities. DOE is seeking public comment on the proposed amendment, on the alternative approaches that follow, and on any other viable approaches.

5a. Alternative Approach 1

The first alternative approach under consideration would be to remove from 10 CFR part 835 most or all of the specific requirements for written procedures. Such requirements would be left to the discretion of cognizant DOE line management in discharging their responsibilities for approval of documented radiation protection programs.

5b. Alternative Approach 2

The second alternative approach under consideration would be to replace most or all of the specific requirements for written procedures in 10 CFR part 835 with a general requirement, added to § 835.101, requiring written procedures to be developed and implemented consistent with the potential hazards created by the activity and the education, training, and skills of the individuals who might be exposed to these hazards.

6. Lung Retention Factors

As explained in ''Use of Appendices'' in Section II.D. of this preamble, DOE is proposing to delete appendix B to 10 CFR part 835 and place the data into a guidance document. Although DOE is proposing to delete appendix B because it does not contain substantive requirements, DOE is seeking public comment on the possible impact of removing the alternative absorption factors and lung retention classes from 10 CFR part 835.

7. Emergency Situations

DOE is proposing revisions to §§ 835.1301 and 835.1302 to clarify requirements for applying the emergency dose guidelines. In light of the uncertainties involved in emergency operations and the fact that the numerical dose values provided are guidelines rather than limits, DOE is proposing to delete the table containing these values from 10 CFR part 835 and relegate them to appropriate emergency management documents. DOE is seeking comments regarding the impact of this

proposal and other alternatives for ensuring adequate radiation protection during emergency operations.

8. Implementation Schedule

In § 835.101(f), DOE has established its proposed schedule for implementing the revised regulatory requirements (approximately three (3) years for the radiobioassay program accreditation requirements and six (6) months after RPP approval for all other requirements). DOE is seeking comments on any possible benefits or drawbacks associated with adhering to this proposed schedule.

B. Written Comment Procedures

Interested parties are invited to participate in this proceeding by submitting written data, views, or arguments with respect to the subjects set forth in this notice. Instructions for submitting written comments are set forth at the beginning of this notice. Written comments (5 copies and a computer disk) should be labeled on the envelope, computer disk, and the documents, ''EH–RM–96–835,'' and must be received by the date specified at the beginning of this notice. All comments and other relevant information received by the date specified at the beginning of this notice will be considered by DOE.

Pursuant to the provisions of 10 CFR 1004.11, any person submitting information or data that is believed to be confidential and exempt by law from public disclosure should submit one complete copy of the document and 3 copies, if possible, from which the information believed to be confidential has been deleted. DOE will make its own determination with regard to the confidential status of the information or data and treat it according to its own determination.

C. Public Hearings

1. Procedures for Submitting Requests To Speak

The dates, times, and locations of the public hearings are indicated at the beginning of this notice. DOE invites any individual who has an interest in these proceedings to make a request for an opportunity to make an oral presentation at the public hearings. Requests may be submitted by telephone at (202) 586–3012. The individual making the request should provide a telephone number where he or she may be contacted. Individuals will be notified as to the approximate time they will be speaking. Each individual who will be speaking is requested to submit 5 copies of his or her statement at the registration desk prior to the beginning of the hearing. In the event any individual wishing to testify cannot meet this request, that individual may make alternate arrangements by calling (202) 586–3012 in advance or by so indicating in the letter requesting to make an oral presentation.

2. Conduct of Hearing

DOE reserves the right to select the individuals to be heard at the hearings, to schedule the respective presentations, and to establish the procedures governing the conduct of the hearings. The length of each presentation is limited to 10 minutes.

A DOE official will be designated to preside at the hearings. The hearings will not be judicial- or evidentiary-type hearings, but will be conducted in accordance with 5 U.S.C. 533 and section 501 of the DOE Organization Act, 42 U.S.C. 7191. At the conclusion of all initial oral statements, each person who has made an oral statement will be given the opportunity to make a rebuttal or clarifying statement, subject to time limitations. Any further procedural rules regarding proper conduct of the hearings will be announced by the presiding official.

Transcripts of the hearings will be made and the entire record of this rulemaking including the transcript will be retained by DOE and made available for inspection at the DOE Freedom of Information Reading Room as provided at the beginning of this notice. Any individual may purchase a copy of the transcript from the transcribing reporter.

IV. Review Under the National Environmental Policy Act

DOE has reviewed the promulgation of this proposed amendment to 10 CFR part 835 under the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 *et seq.*) and the Council on Environmental Quality regulations for implementing NEPA (40 CFR parts 1500–1508). DOE has completed an Environmental Assessment and on the basis of that information has issued a Finding of No Significant Impact (FONSI) for this proposed amendment. The Environmental Assessment and FONSI are available for inspection at the DOE Freedom of Information Reading Room, 1E–190, 1000 Independence Ave. SW, Washington, DC 20585, between the hours of 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays. Comments on this finding should be provided to DOE at the address listed for all other comments.

V. Review Under Regulatory Flexibility Act

The Regulatory Flexibility Act, 5 U.S.C. 601–612, requires that an agency prepare an initial regulatory flexibility analysis and publish it at the time of publication of general notice of rulemaking for the rule. This requirement does not apply if the agency certifies that the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities. 5 U.S.C. 605(b).

The proposed rule would amend DOE's regulations governing programs established at DOE facilities to protect individuals from ionizing radiation resulting from DOE activities. The contractors who manage and operate DOE facilities are responsible for implementing the occupational radiation protection program. DOE has considered whether management and operating (M&O) contractors are ''small businesses,'' as that term is defined by the Regulatory Flexibility Act (5 U.S.C. 601(3)). The Regulatory Flexibility Act's definition incorporates the definition of ''small business concern'' in the Small Business Act, which the Small Business Administration (SBA) has developed through size standards in 13 CFR part 121. Small businesses are business concerns which, together with their affiliates, have no more than 500 to 1500 employees, varying by SIC category, and annual receipts of between $0.5 million to $25 million, again varying by SIC category. See Small Business Administration, Final Rule on ''Small Business Size Standards,'' 61 FR 3280, at 3289–94 (January 31, 1996). DOE's M&O contractors exceed SBA's size standards for small businesses. In addition, it is noted that M&O contractors are reimbursed through their contracts with DOE for the costs of complying with DOE occupational radiation protection requirements. They will not, therefore, be adversely impacted by the requirements in the proposed rule. For these reasons, DOE certifies that the proposed rule, if promulgated, will not have a significant economic impact on a substantial number of small entities.

VI. Review Under Executive Order 12866

Today's regulatory action has been determined not to be a ''significant regulatory action'' under Executive Order 12866, ''Regulatory Planning and Review'' (58 FR 51735, October 4, 1993). Accordingly, today's action was not subject to review under the Executive Order by the Office of Information and

Regulatory Affairs within the Office of Management and Budget.

VII. Review Under Executive Order 12612

Executive Order 12612, 52 FR 41685 (October 30, 1987) requires that regulations, rules, legislation, and any other policy actions be reviewed for any substantial direct effects on States, on the relationship between the National Government and the States, or in the distribution of power and responsibilities among various levels of government. If there are sufficient substantial direct effects, then the Executive Order requires preparation of a federalism assessment to be used in all decisions involved in promulgating and implementing a policy action.

This proposed rule would not have a substantial direct effect on the institutional interests or traditional functions of States.

VIII. Review Under Executive Order 12988

With respect to the review of existing regulations and the promulgation of new regulations, section 3(a) of Executive Order 12988, ''Civil Justice Reform,'' 61 FR 4729 (February 7, 1996), imposes on Executive agencies the general duty to adhere to the following requirements: (a) eliminate drafting errors and ambiguity; (2) write regulations to minimize litigation; and (3) provide a clear legal standard for affected conduct rather than a general standard and promote simplification and burden reduction. With regard to the review required by section 3(a), section 3(b) of Executive Order 12988 specifically requires that Executive agencies make every reasonable effort to ensure that the regulation: (1) clearly specifies the preemptive effect, if any; (2) clearly specifies any effect on existing Federal law or regulation; (3) provides a clear legal standard for affected conduct while promoting simplification and burden reduction; (4) specifies the retroactive effect, if any; (5) adequately defines key terms; and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. Section 3(c) of Executive Order 12988 requires Executive agencies to review regulations in light of applicable standards in section 3(a) and section 3(b) to determine whether they are met or it is unreasonable to meet one or more of them. DOE has completed the required review and determined that, to the extent permitted by law, the proposed amendments to 10 CFR part 835 meet the relevant standards of Executive Order 12988.

IX. Review Under Paperwork Reduction Act

The information and reporting requirements in this part would not be substantially different from existing reporting requirements provided in DOE contracts with DOE prime contractors covered by this rule. This proposed amendment would codify recordkeeping and reporting requirements currently provided in Departmental standards implemented by DOE contractors through contractual commitments. DOE will submit the collection of any new information requests concerning this rule to the Office of Management and Budget for approval in accordance with the Paperwork Reduction Act of 1980, 44 U.S.C. 3501.1 *et seq.*, and the procedures implementing that Act, 5 CFR 1320.1 *et seq.*

X. Review Under the Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (the Act), enacted as Pub. L. 104–4 on March 22, 1995, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a proposed or final agency rule that may result in the expenditure by State, local, and tribal governments, in the aggregate or by the private sector, of $100 million or more (adjusted annually for inflation) in any one year. Section 204(a) of the Act, 2 U.S.C. 1534(a), requires the Federal agency to develop an effective process to permit timely input by elected officers (or their designees) of State, local, and tribal governments on a proposed ''significant intergovernmental mandate.'' Section 203 of the Act, which supplements section 204(a), provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, the agency shall have developed a plan that, among other things, provides for notice to potentially affected small governments, if any, and for a meaningful and timely opportunity to provide input in the development of regulatory proposals. 2 U.S.C. 1533.

The proposed rule published today does not contain any Federal mandate. The provisions on 10 CFR part 835 apply only to activities conducted by or for DOE. Any costs resulting from implementation of DOE's occupational radiation protection program are ultimately borne by the Federal government. Therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply.

List of Subjects in 10 CFR Part 835

Emergency radiation exposures, Nuclear material, Occupational safety and health, Radiation exposures, Radiation protection, Radioactive material, Reporting and recordkeeping requirements, Safety during emergencies, Training.

Issued in Washington, DC, on December 12, 1996.

Tara O'Toole,

Assistant Secretary, Environment, Safety and Health.

For the reasons set forth in the preamble, Title 10, Code of Federal Regulations, Part 835 is proposed to be amended as set forth below:

10 CFR PART 835—OCCUPATIONAL RADIATION PROTECTION

1. The authority citation for Part 835 continues to read as follows:

Authority: 42 U.S.C. 2201; 7191.

Subpart A—General Provisions

2. Section 835.1 is amended by revising the introductory text of paragraph (b) and paragraph (b)(3), redesignating paragraph (b)(4) as (b)(6), and revising it, and by adding paragraphs (b)(4), (b)(5), and (c) as follows:

§ 835.1 Scope.

* * * * *

(b) *Exclusion.* Except as discussed in paragraph (c) of this section, the requirements in this part do not apply to: * * *

(3) Activities conducted under the Nuclear Explosives and Weapons Safety Program relating to the prevention of accidental or unauthorized nuclear detonations to the extent a requirement under this part cannot be implemented without compromising the effectiveness of such activities;

(4) Radioactive material transportation conducted in compliance with DOE Orders for such transportation;

(5) DOE activities conducted outside the United States on territory under the jurisdiction of a foreign government to the extent governed by occupational radiation protection requirements agreed to between the United States and the cognizant government; or

(6) Background radiation, radiation doses received as a patient for the purposes of medical diagnosis or therapy, or radiation doses received from participation as a subject in medical research programs.

(c) Occupational doses received as a result of excluded activities and radioactive material transportation, as listed in paragraphs (b)(1) through (b)(5) of this section, shall be considered when determining compliance with the occupational dose limits in §§ 835.202 and 835.207. Occupational doses resulting from authorized emergency exposures and planned special exposures shall not be considered when determining compliance with the dose limits in §§ 835.202 and 835.207.

3. In § 835.2, paragraph (a) is amended by removing definitions of the terms ''ambient air'' and ''continuous air monitor''; ''DOE activities'' and ''occupational exposure'' by adding in alphabetical order definitions for the terms ''accountable sealed radioactive source'', ''derived air concentration-hour'', ''DOE activity'', ''occupational dose'', ''radioactive material area'', ''radioactive material transportation'', ''radiological control technician'', ''real-time air monitoring'', ''respiratory protective device'', ''sealed radioactive source'', ''source leak test'', and ''week'' as follows; and revising the definitions of the terms ''airborne radioactive material or airborne radioactivity'', ''airborne radioactivity area'', ''contamination area'', ''controlled area'', ''declared pregnant worker'', ''high contamination area'', ''member of the public'', ''monitoring'', ''radiological area'', and ''year'' to read as follows. In § 835.2, paragraph (b), the definition of ''collective dose'' is removed and the definitions of the terms ''cumulative total effective dose equivalent'', ''effective dose equivalent'', ''external dose or exposure'', ''quality factor'', ''total effective dose equivalent'', and ''weighting factor'' are revised as follows. Paragraph (d) of § 835.2 is removed.

§ 835.2 Definitions.

(a) As used in this part:

Accountable sealed radioactive source means a sealed radioactive source having a half-life equal to or greater than 30 days and an isotopic activity equal to or greater than the corresponding value provided in appendix E to this part.

Airborne radioactive material or airborne radioactivity means radioactive material dispersed in the air in the form of dusts, fumes, particulates, mists, vapors, or gases.

Airborne radioactivity area means any area, accessible to individuals, where the concentration of airborne radioactivity, above natural background, exceeds or is likely to exceed 10 percent of the derived air concentration (DAC) values listed in appendix A or appendix C to this part.

* * * * *

Contamination area means any area, accessible to individuals, where removable contamination levels exceed or are likely to exceed the surface radioactivity values specified in appendix D to this part, but do not exceed 100 times those values.

* * * * *

Controlled area means any area to which access is managed by or for DOE to protect individuals from exposure to radiation and/or radioactive material.

Declared pregnant worker means a woman who has voluntarily declared to her employer, in writing, her pregnancy for the purpose of being subject to the occupational dose limits to the embryo/fetus as provided in § 835.206. This declaration may be revoked, in writing, at any time by the declared pregnant worker.

* * * * *

Derived air concentration-hour (DAC-hour) is the product of the concentration of radioactive material in air (expressed as a fraction or multiple of the DAC for each radionuclide) and the time of exposure to that radionuclide, in hours.

DOE activity means an activity taken for or by DOE in a DOE operation or facility that has the potential to result in the occupational exposure of an individual to radiation or radioactive material. The activity may be, but is not limited to, design, construction, operation, or decommissioning. To the extent appropriate, the activity may involve a single DOE facility or operation or a combination of facilities and operations, possibly including an entire site or multiple DOE sites.

* * * * *

High contamination area means any area, accessible to individuals, where removable contamination levels exceed or are likely to exceed 100 times the surface radioactivity values specified in appendix D to this part.

* * * * *

Member of the public means an individual who is not a general employee. An individual is not a ''member of the public'' during any period in which the individual receives an occupational dose.

* * * * *

Monitoring means the measurement of radiation levels, airborne radioactivity concentrations, radioactive contamination levels, or quantities of radioactive material and the use of the results of these measurements to evaluate potential and actual exposures to ionizing radiation.

* * * * *

Occupational dose means an individual's ionizing radiation dose (external and internal) as a result of that individual's work assignment. Occupational dose does not include doses received as a medical patient or doses resulting from background radiation or participation as a subject in medical research programs.

* * * * *

Radioactive material area means any area, accessible to individuals, in which items or containers of radioactive material exist and the total activity of radioactive material exceeds ten times the applicable values provided in appendix E to this part.

Radioactive material transportation means the movement of radioactive material having a specific activity in excess of 0.002 microcurie per gram by aircraft, rail, vessel, or highway vehicle outside of a controlled area. Radioactive material transportation does not include preparation of material or packagings for transportation, conduct of surveys required by this part, or application of markings and labels required for transportation.

Radiological area means any area(s) within a controlled area defined as a ''radioactive material area,'' ''radiation area,'' ''high radiation area,'' ''very high radiation area,'' ''contamination area,'' ''high contamination area,'' or ''airborne radioactivity area'' in accordance with this section.

Radiological control technician means a radiological worker whose primary job assignment involves monitoring of workplace radiological conditions, specification of protective measures, and provision of assistance and guidance to other individuals in implementation of radiological controls.

* * * * *

Real-time air monitoring means measurement of the concentrations or quantities of airborne radioactive materials on a continuous basis.

* * * * *

Respiratory protective device means an apparatus, such as a respirator, used to reduce an individual's intake of airborne radioactive materials.

Sealed radioactive source means a radioactive source manufactured, obtained, or retained for the purpose of utilizing the emitted radiation. The sealed radioactive source consists of a known or estimated quantity of radioactive material contained within a sealed capsule, sealed between layer(s) of non-radioactive material, or firmly fixed to a non-radioactive surface by electroplating or other means intended to prevent leakage or escape of the radioactive material.

Source leak test means a test to determine if a sealed radioactive source is leaking radioactive material.

* * * * *

Week means a period of seven consecutive days beginning on Sunday.

Year means the period of time beginning on or near January 1 and ending on or near December 31 of that same year used to determine compliance with the provisions of this part. The starting and ending date of the year used to determine compliance may be changed provided that the change is made at the beginning of the year and that no day is omitted or duplicated in consecutive years.

(b) * * *

Cumulative total effective dose equivalent means the sum of all total effective dose equivalent values recorded for an individual, where available, for each year occupational exposure was received, beginning January 1, 1989.

* * * * *

Effective dose equivalent (H_E) means the summation of the products of the dose equivalent received by specified tissues of the body (H_T) and the appropriate weighting factor (w_T)—that is, $H_E=\Sigma w_T H_T$. It includes the dose from radiation sources internal and/or external to the body. For purposes of compliance with this part, deep dose equivalent to the whole body may be used as effective dose equivalent for external exposures. The effective dose equivalent is expressed in units of rem (or sievert).

External dose or exposure means that portion of the dose equivalent received from radiation sources outside the body (i.e., ''external sources'').

* * * * *

Quality factor (Q) means the principal modifying factor used to calculate the dose equivalent from the absorbed dose; the absorbed dose (expressed in rad or gray) is multiplied by the appropriate quality factor.

(i) The quality factors to be used for determining dose equivalent in rem are shown below:

QUALITY FACTORS

Radiation type	Quality factor
X-rays, gamma rays, positrons, electrons (including tritium beta particles)	1
Neutrons, ≤10 keV	3
Neutrons, >10 keV	10
Protons and singly-charged particles of unknown energy with rest mass greater than one atomic mass unit	10

QUALITY FACTORS—Continued

Radiation type	Quality factor
Alpha particles and multiple-charged particles (and particles of unknown charge) of unknown energy	20

When spectral data are insufficient to identify the energy of the neutrons, a quality factor of 10 shall be used.

(ii) When spectral data are sufficient to identify the energy of the neutrons, the following mean quality factor values may be used:

QUALITY FACTORS FOR NEUTRONS

[Mean quality factors, $\bar{Q}$ (maximum value in a 30-cm dosimetry phantom), and values of neutron flux density that deliver in 40 hours, a maximum dose equivalent of 100 mrem (0.001 sievert). Where neutron energy falls between listed values, the more restrictive mean quality factor shall be used.]

Neutron energy (MeV)	Mean quality factor	Neutron flux density ($cm^{-2}s^{-1}$)
2.5×10^{-8} thermal	2	680
1×10^{-7}	2	680
1×10^{-6}	2	560
1×10^{-5}	2	560
1×10^{-4}	2	580
1×10^{-3}	2	680
1×10^{-2}	2.5	700
1×10^{-1}	7.5	115
5×10^{-1}	11	27
1	11	19
2.5	9	20
5	8	16
7	7	17
10	6.5	17
14	7.5	12
20	8	11
40	7	10
60	5.5	11
1×10^{2}	4	14
2×10^{2}	3.5	13
3×10^{2}	3.5	11
4×10^{2}	3.5	10

* * * * *

Total effective dose equivalent (TEDE) means the sum of the effective dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures).

Weighting factor (w_T) means the fraction of the overall health risk, resulting from uniform, whole body irradiation, attributable to specific tissue (T). The dose equivalent to tissue, H_T, is multiplied by the appropriate weighting factor to obtain the dose equivalent to that tissue. The weighting factors are as follows:

WEIGHTING FACTORS FOR VARIOUS ORGANS AND TISSUES

Organs or tissues, T	Weighting factor, w_T
Gonads	0.25
Breasts	0.15
Red bone marrow	0.12
Lungs	0.12
Thyroid	0.03
Bone surfaces	0.03
Remainder[1]	0.30
Whole body[2]	1.00

[1] ''Remainder'' means the five other organs or tissues with the highest dose (e.g., liver, kidney, spleen, thymus, adrenal, pancreas, stomach, small intestine, and upper large intestine). The weighting factor for each remaining organ or tissue is 0.06.

[2] For the case of uniform external irradiation of the whole body, a weighting factor (w_T) equal to 1 may be used in determination of the effective dose equivalent.

* * * * *

§ 835.4 [Amended]

4. Section 835.4 is amended by adding ''roentgen,'' after ''rad,'' in the first sentence and removing the last sentence.

Subpart B—Radiation Protection Programs

5. Section 835.101 is amended by revising paragraph (f) to read as follows, removing paragraph (g), and redesignating paragraphs (h), (i), and (j) as (g), (h), and (i) respectively; in paragraph (d), the reference to ''§ 835.101(i)'' is changed to ''§ 835.101(h)''.

§ 835.101 Radiation protection programs.

* * * * *

(f) The RPP shall include plans, schedules, and other measures for achieving compliance with regulations of this part. Unless otherwise specified, compliance with amendments to this part shall be achieved no later than 180 days following approval of the revised RPP by DOE. Compliance with the requirements of § 835.402(d) for radiobioassay program accreditation must be achieved no later than January 1, 2000.

* * * * *

6. Section 835.102 is revised to read as follows:

§ 835.102 Internal audits

Internal audits of the radiation protection program, including examination of program content and implementation, shall be conducted through a process that ensures that all functional elements are reviewed no less frequently than every 36 months.

7. Section 835.202 is amended by revising the section heading, revising

the introductory text of paragraph (a), and revising paragraphs (b) and (c) to read as follows:

§ 835.202 Occupational dose limits for general employees.

(a) The occupational exposure to general employees resulting from DOE activities, other than planned special exposures under § 835.204 and emergency exposures conducted in compliance with DOE Orders for emergency operations, shall be controlled so the following limits from all occupational doses are not exceeded in a year:

* * * * *

(b) All occupational doses received during the current year, except doses resulting from planned special exposures under § 835.204 and emergency exposures conducted in compliance with DOE Orders for emergency operations, shall be included when demonstrating compliance with §§ 835.202(a) and 835.207.

(c) Exposures from background, therapeutic and diagnostic medical radiation, and participation as a subject in medical research programs shall not be included in dose records or in the assessment of compliance with the occupational dose limits.

8. Section 835.203 is amended by revising the section heading and paragraph (a) to read as follows and by removing paragraph (c):

§ 835.203 Combining internal and external dose equivalents.

(a) For individuals monitored in accordance with § 835.402 (a) and (c), the total effective dose equivalent during a year shall be determined by summing the effective dose equivalent from external exposures and the committed effective dose equivalent from intakes during the year. For individual monitoring that is performed, but not required by either § 835.402(a) or § 835.402(c) (non-mandatory monitoring), summing of the external and internal doses is required only when the dose determined by the non-mandatory monitoring exceeds the associated monitoring threshold established in § 835.402(a) or § 835.402(c).

* * * * *

9. Section 835.204 is amended by revising paragraphs (a)(3), (c)(1), (c)(2) and (d) to read as follows:

§ 835.204 Planned special exposures.

(a) * * *

(3) Joint written approval is received from the appropriate DOE Headquarters program office and the Secretarial Officer responsible for environment, safety and health matters.

* * * * *

(c) * * *

(1) In a year, the numerical value of the dose limits established in § 835.202; or

(2) Over the individual's lifetime, five times the numerical value of the dose limits established in § 835.202.

(d) Prior to a planned special exposure, written consent shall be obtained from each individual involved. Each such written consent shall include:

(1) The purpose of the planned operations and procedures to be used;

(2) The estimated doses and associated potential risks and specific radiological conditions and other hazards which might be involved in performing the task; and

(3) Instructions on the measures to be taken to keep the dose ALARA considering other risks that may be present.

* * * * *

10. Section 835.207 is revised to read as follows:

§ 835.207 Occupational dose limits for minors.

No minor shall be occupationally exposed to radiation and/or radioactive material during direct on-site access at a DOE site or facility in excess of 0.1 rem (0.001 sievert) total effective dose equivalent or be occupationally exposed in excess of 10 percent of the limits for general employees specified in § 835.202(a) (2), (3), and (4) in a year.

11. Section 835.208 is revised to read as follows:

§ 835.208 Limits for members of the public entering a controlled area.

No member of the public shall be exposed to radiation and/or radioactive material during access to the controlled area at a DOE site or facility in excess of 0.1 rem (0.001 sievert) total effective dose equivalent in a year.

§ 835.209 [Amended]

12. Section 835.209 is amended by removing paragraph (b) and redesignating paragraph (c) as (b).

Subpart E—Monitoring in the Workplace

13. Section 835.401 is amended by revising the introductory text of paragraphs (a) and (c) and paragraph (c)(1) to read as follows:

§ 835.401 General requirements.

(a) Monitoring and surveys shall be performed to:

* * * * *

(c) Instruments and equipment used for monitoring and surveys shall be:

(1) Periodically maintained and calibrated on an established frequency of at least once every twelve months;

* * * * *

14. Section § 835.402 is revised to read as follows:

§ 835.402 Individual monitoring.

(a) For the purpose of monitoring individual exposures to external radiation, personnel dosimeters shall be provided to and used by:

(1) Radiological workers who, under typical conditions, are likely to receive one or more of the following:

(i) A deep dose equivalent to any portion of the whole body of 0.1 rem (0.001 sievert) or more in a year;

(ii) A shallow dose equivalent to the skin or to any extremity of 5 rems (0.05 sievert) or more in a year;

(iii) A lens of the eye dose equivalent of 1.5 rems (0.015 sievert) or more in a year;

(2) Declared pregnant workers who are likely to receive from external sources a dose equivalent to the embryo/fetus in excess of 10 percent of the applicable limit in § 835.206;

(3) Occupationally exposed minors likely to receive a dose in excess of 50 percent of the applicable limits in § 835.207 in a year from external sources;

(4) Members of the public entering a controlled area likely to receive a dose in excess of 50 percent of the limit in § 835.208 in a year from external sources; or

(5) Individuals entering a high or very high radiation area.

(b) External dose monitoring programs shall be adequate to demonstrate compliance with the dose limits established in subpart C of this part. Except as provided in paragraph (e) of this section, personnel dosimetry programs implemented to demonstrate compliance with § 835.402(a) shall:

(1) Be accredited in accordance with the DOE Laboratory Accreditation Program for Personnel Dosimetry; or,

(2) Be excepted from accreditation in accordance with the DOE Laboratory Accreditation Program for Personnel Dosimetry.

(c) For the purpose of monitoring individual exposures to internal radiation, internal dosimetry programs (including routine bioassay programs) shall be conducted for:

(1) Radiological workers who, under typical conditions, are likely to receive 0.1 rem (0.001 sievert) or more committed effective dose equivalent from all occupational radionuclide intakes in a year;

(2) Declared pregnant workers likely to receive an intake resulting in a dose equivalent to the embryo/fetus in excess of 10 percent of the limit stated in § 835.206;

(3) Occupationally exposed minors who are likely to receive a committed effective dose equivalent in excess of 50 percent of the applicable limit stated in § 835.207 from all radionuclide intakes in a year; or

(4) Members of the public entering a controlled area likely to receive a committed effective dose equivalent in excess of 50 percent of the limit stated in § 835.208 from all radionuclide intakes in a year.

(d) Internal dose monitoring programs shall be adequate to demonstrate compliance with the dose limits established in subpart C of this part. Except as provided in paragraph (e) of this section, radiobioassay programs implemented to demonstrate compliance with § 835.402(c) shall:

(1) Be accredited in accordance with the DOE Laboratory Accreditation Program for Radiobioassay; or

(2) Be excepted from accreditation in accordance with the DOE Laboratory Accreditation Program for Radiobioassay.

(e) Personnel Dosimetry or Radiobioassay Programs implemented to demonstrate compliance with § 835.402(a) or § 835.402(c) respectively, that do not comply with the DOE Laboratory Accreditation Program Administration Technical Standard (latest version) require the approval of the Secretarial Officer responsible for environment, safety and health matters. Approval may be given if such programs demonstrate performance equivalent to that of programs accredited under the applicable DOE Laboratory Accreditation Program.

15. Section 835.403 is revised to read as follows:

§ 835.403 Air monitoring.

Monitoring of airborne radioactivity concentrations shall be performed in accordance with the provisions of this section.

(a) Air sampling shall be performed:

(1) Where an individual is likely to receive an exposure of 40 or more DAC-hours in a year. Samples representative of air inhaled by workers shall be taken as necessary to detect and evaluate the level or concentration of airborne radioactive material at work locations; or

(2) Where respiratory protective devices for protection against airborne radionuclides have been prescribed.

(b) Real-time air monitoring shall be performed where unexpected increases in airborne radioactivity levels are likely to result in an exposure to an individual exceeding 40 DAC-hours in one week.

(c) For the airborne radioactive material that could be encountered, real-time air monitors shall have alarm capability and sufficient sensitivity to alert potentially exposed individuals that immediate action is necessary in order to minimize or terminate inhalation exposures.

16. Section 835.404 is amended by revising paragraphs (d) and (f) to read as follows:

§ 835.404 Radioactive contamination control and monitoring.

* * * * *

(d) Areas accessible to individuals where the measured total contamination levels exceed the total surface radioactivity values specified in appendix D to this part, but the removable contamination levels are less than the removable surface radioactivity values specified in appendix D to this part, shall be controlled as follows when located outside of radiological areas:

(1) The area shall be routinely surveyed to ensure the removable contamination level remains below the values specified in appendix D to this part;

(2) The area shall be conspicuously marked to warn individuals of the contaminated status; and

(3) Written procedures shall be established and implemented to prevent unplanned or uncontrolled removal of the radioactive material.

* * * * *

(f) Appropriate monitoring to detect the presence of contamination shall be performed by individuals exiting radiological areas established to control removable contamination and/or airborne radioactivity.

* * * * *

17. Section 835.405 is added to subpart E to read as follows:

§ 835.405 Receipt of radioactive packages.

(a) If packages containing quantities of radioactive material in excess of a Type A quantity (as defined in 10 CFR 71.4) are expected to be received, arrangements shall be made to either:

(1) Take possession of the package when the carrier offers it for delivery; or

(2) Receive notification as soon as practicable after arrival of the package at the carrier's terminal and to take possession of the package expeditiously after receiving notification.

(b) External surfaces of packages known to contain radioactive material shall be surveyed for radioactive contamination if the package:

(1) Is labeled with a Radioactive White I, Yellow II, or Yellow III label (as specified in 49 CFR 172.403 and 172.436–440); or

(2) Has been transported as low specific activity material on an exclusive use vehicle (as these terms are defined in 10 CFR 71.4); or

(3) Has evidence of degradation, such as packages that are crushed, wet, or damaged.

(c) External surfaces of packages known to contain radioactive material shall be surveyed for radiation levels if the package:

(1) Is labeled with a Radioactive White I, Yellow II, or Yellow III label (as specified 49 CFR 172.403 and 172.436–440) and contains a Type A (as defined in 10 CFR 71.4) or greater quantity of radioactive material; or

(2) Has been transported as low specific activity material on an exclusive use vehicle (as these terms are defined in 10 CFR 71.4); or

(3) Has evidence of degradation, such as packages that are crushed, wet, or damaged.

(d) The surveys required by paragraphs (b) and (c) of this section shall be performed as soon as practicable after receipt of the package, but not later than 3 hours after the package is received if it is received during normal working hours, or not later than 3 hours from the beginning of the next working day if it is received after working hours.

(e) Surveys of received packages for radioactive contamination are not necessary if the package contains only special form (as defined in 10 CFR 71.4) or gaseous radioactive material.

(f) Written procedures for safely opening packages in which radioactive material is received shall be established and implemented. These procedures shall give due consideration to special instructions for the type of package being opened.

Subpart F—Entry Control Program

18. Section 835.501 is amended by revising paragraph (d), redesignating paragraph (e) as paragraph (f), and adding a new paragraph (e) to read as follows:

§ 835.501 Radiological areas.

* * * * *

(d) Written procedures shall be established and implemented as necessary to demonstrate compliance with the provisions of this subpart. The procedures shall include actions required to ensure the effectiveness and operability of barricades, devices, alarms, and locks.

(e) Written authorizations shall be required to control entry into and perform work within radiological areas. These authorizations shall specify radiation protection measures commensurate with the existing and potential hazards.

* * * * *

19. In § 835.502, paragraphs (a), (b), and (c) are redesignated as paragraphs (b), (c), and (d) respectively; the paragraph heading of redesignated paragraph (b) is revised to read ''Physical controls''; and new paragraph (a) is added and redesignated paragraph (c) is revised as follows:

§ 835.502 High and very high radiation areas.

(a) The following measures shall be implemented for each entry into a high radiation area:

(1) The area shall be surveyed as necessary during access to determine the exposure rates to which the individual is exposed; and

(2) Each individual shall be provided a supplemental dosimetry device capable of providing an immediate indication of the individual's integrated dose during the entry.

* * * * *

(c) *Very high radiation areas.* In addition to the above requirements, additional measures shall be implemented to ensure individuals are not able to gain access to very high radiation areas.

Subpart G—Posting and Labeling

20. Section 835.601 is revised to read as follows:

§ 835.601 General requirements.

(a) Areas shall be posted in accordance with this subpart to provide warning to individuals of the presence, or potential presence, of radiation or radioactive materials.

(b) Except as provided in § 835.602(b), postings and labels required by this subpart shall include the standard radiation warning trefoil in black or magenta imposed upon a yellow background.

(c) Signs required by this subpart shall be clearly and conspicuously posted and may include radiological protection instructions.

(d) The posting and labeling requirements in this subpart may be modified to reflect the special considerations of DOE activities conducted at private residences or businesses. Such modifications shall provide the same level of protection to individuals as the existing provisions in this subpart.

21. Section 835.602 is amended by revising paragraph (a) to read as follows:

§ 835.602 Controlled areas.

(a) Each access point to a controlled area (as defined in § 835.2) shall be posted whenever radiological areas exist in the area. Individuals who enter only the controlled area without entering radiological areas are not expected to receive a total effective dose equivalent of more than 100 mrem (0.001 sievert) in a year.

* * * * *

22. Section 835.603 is revised to read as follows:

§ 835.603 Radiological areas.

Each access point to a radiological area (as defined in § 835.2) shall be posted with conspicuous signs bearing the wording provided in this section.

(a) *Radiation Area.* The words ''Caution, Radiation Area'' shall be posted at each radiation area.

(b) *High Radiation Area.* The words ''Caution, High Radiation Area'' or ''Danger, High Radiation Area'' shall be posted at each high radiation area.

(c) *Very High Radiation Area.* The words ''Grave Danger, Very High Radiation Area'' shall be posted at each very high radiation area.

(d) *Airborne Radioactivity Area.* The words ''Caution, Airborne Radioactivity Area'' or ''Danger, Airborne Radioactivity Area'' shall be posted at each airborne radioactivity area.

(e) *Contamination Area.* The words ''Caution, Contamination Area'' shall be posted at each contamination area.

(f) *High Contamination Area.* The words ''Caution, High Contamination Area'' or ''Danger, High Contamination Area'' shall be posted at each high contamination area.

(g) *Radioactive Material Area.* The words ''Caution, Radioactive Material(s)'' or ''Danger, Radioactive Material(s)'' shall be posted at each radioactive material area.

23. Section 835.604 is added to subpart G to read as follows:

§ 835.604 Exceptions to posting requirements.

(a) Areas may be excepted from the posting requirements of § 835.603 for periods of less than 8 continuous hours when placed under continuous observation and control of an individual knowledgeable of, and empowered to implement, required access and exposure control measures.

(b) The following areas are excepted from the radioactive material area posting requirements of § 835.603(g):

(1) Areas posted in accordance with § 835.603(a) through (f); and

(2) Areas in which each item or container of radioactive material is clearly and adequately labeled such that individuals entering the area are made aware of the hazard.

(c) Areas containing only packages received from radioactive material transportation need not be posted in accordance with § 835.603 until the packages are surveyed in accordance with § 835.405.

24. Section 835.605 is added to subpart G to read as follows:

§ 835.605 Labeling items and containers.

Except as provided in § 835.606, each item or container of radioactive material shall bear a durable, clearly visible label bearing the standard radiation warning trefoil and the words ''Caution, Radioactive Material'' or ''Danger, Radioactive Material.'' The label shall also provide sufficient information to permit individuals handling or using the items or containers, or working in the vicinity of the items or containers, to take precautions to avoid or minimize exposures.

25. Section 835.606 is added to subpart G to read as follows:

§ 835.606 Exceptions to labeling requirements.

Items and containers are excepted from the radioactive material labeling requirements of § 835.605 when:

(a) Used, handled, or stored in areas posted and controlled in accordance with §§ 835.603 and 835.604 and sufficient information is provided to permit individuals to take appropriate protective actions; or

(b) The quantity of radioactive material is below the values specified in appendix E to this part; or

(c) Packaged, labeled, and marked in accordance with the regulations of the Department of Transportation or corresponding DOE Orders; or

(d) Accessible only to individuals authorized to handle or use them, or to work in the vicinity; or

(e) Installed in manufacturing or process equipment, such as reactor components, piping, and tanks.

Subpart H—Records

26. Section 835.702 of subpart H, paragraphs (b), (c), (d), and (e) are revised to read as follows:

835.702 Individual monitoring records.

* * * * *

(b) The results of individual external and internal dose monitoring that is performed, but not required by § 835.402, shall be recorded if the resulting doses exceed the monitoring thresholds of § 835.402(a) or

§ 835.402(c). Recording of the non-uniform shallow dose equivalent to the skin as determined under § 835.205 is not required if the dose is less than 2 percent of the limit specified for the skin in § 835.202(a)(4).

(c) The records required by this section shall:

(1) Be sufficient to evaluate compliance with subpart C of this part;

(2) Be sufficient to provide dose information necessary to complete reports required by subpart I of this part and by DOE requirements for occurrence reporting and processing;

(3) Include the following quantities for external dose received during the year:

(i) The effective dose equivalent from external sources of radiation (deep dose equivalent may be used as effective dose equivalent for external exposure);

(ii) The lens of the eye dose equivalent;

(iii) The shallow dose equivalent to the skin; and

(iv) The shallow dose equivalent to the extremities.

(4) Include the following information for internal dose resulting from intakes received during the year:

(i) Committed effective dose equivalent;

(ii) Committed dose equivalent to any organ or tissue of concern; and

(iii) Identity of radionuclides.

(5) Include the following quantities for the summation of the external and internal dose:

(i) Total effective dose equivalent in a year;

(ii) For any organ or tissue assigned an internal dose during the year, the sum of the deep dose equivalent from external exposures and the committed dose equivalent to that organ or tissue; and

(iii) Cumulative total effective dose equivalent.

(6) Include the dose equivalent to the embryo/fetus of a declared pregnant worker.

(d) Documentation of all occupational doses received during the current year, except for doses resulting from planned special exposures under § 835.204 and emergency exposures conducted in compliance with DOE Orders for emergency operations, shall be obtained to demonstrate compliance with § 835.202(a). If complete records documenting previous occupational dose during the year cannot be obtained, a written estimate signed by the individual may be used to demonstrate compliance.

(e) For radiological workers whose occupational exposure is monitored in accordance with § 835.402, efforts shall be made to obtain complete records of prior years occupational internal and external doses. If complete records documenting prior years occupational doses cannot be obtained, a written estimate signed by the individual may be accepted.

* * * * *

27. In § 835.703, paragraphs (b), (c) and (d)(1) are revised to read as follows:

§ 835.703 Monitoring and workplace records.

* * * * *

(b) Monitoring and survey results used to determine individual occupational dose from external and internal sources;

(c) Results of surveys for the release and control of material and equipment as required by § 835.1101. These records shall describe the property, date on which the survey was performed, identity of the individual who performed the survey, type and identification number of the survey instrument used, and results of the survey; and

(d) * * *

(1) Instruments and equipment used for surveys and monitoring as required by § 835.401; and

* * * * *

28. Section 835.704, paragraph (a) is amended by removing the reference to ‘‘, 835.902, and 835.903’’; paragraph (b) is amended by removing the reference to ‘‘, 835.1002,’’; paragraph (d) is revised and a new paragraph (f) is added as follows:

§ 835.704 Administrative records.

* * * * *

(d) Written declarations of pregnancy and revocations of declarations of pregnancy shall be maintained.

* * * * *

(f) Records shall be maintained as necessary to evaluate compliance with the requirements of §§ 835.1201 and 835.1202 for sealed radioactive source written procedures, inventory, and source leak tests.

Subpart I—Reports to Individuals

29. Section 835.801, paragraph (a) is revised to read as follows:

§ 835.801 Reports to individuals.

(a) Radiation exposure data for individuals monitored in accordance with § 835.402 shall be reported as specified in this section. The information shall include the data required under § 835.702(c). Each notification and report shall be in writing and include: the DOE site or facility name, the name of the individual, and the individual's social security number, employee number, or other unique identification number.

* * * * *

Subpart J—Radiation Safety Training

30. In subpart J, § 835.901 is revised to read as follows:

§ 835.901 Radiation safety training.

(a) Radiation safety training programs shall be established as necessary to ensure compliance with the requirements of this section.

(b) Radiation safety training shall include the following topics, to the extent appropriate to each individual's prior training, anticipated and actual assignments, and degree of exposure to potential radiological hazards:

(1) Risks of exposure to radiation and radioactive materials, including prenatal radiation exposure;

(2) Basic radiological fundamentals and radiation protection concepts;

(3) Controls, limits, policies, procedures, alarms, and other measures implemented at the facility to minimize exposures to radiation and radioactive materials, including both routine and emergency actions;

(4) Individual rights and responsibilities as related to implementation of the facility radiation protection program;

(5) Individual responsibilities for implementing ALARA measures required by § 835.101; and

(6) Individual exposure reports that may be requested in accordance with § 835.801.

(c) Individuals shall complete radiation safety training before being permitted unescorted access to controlled areas and prior to receiving occupational exposure during access to controlled areas at a DOE site or facility.

(d) Each individual shall demonstrate knowledge of the radiation safety training topics established in § 835.901(b), commensurate with the hazards in the area and required controls, by successful completion of an examination and performance demonstrations prior to being permitted unescorted access to radiological areas and prior to performing unescorted assignments as a radiological worker.

(e) Each radiological control technician shall demonstrate knowledge of the radiation safety training topics established in § 835.901(b), commensurate with the hazards and required controls, by successful completion of an examination and performance demonstrations prior to performing unescorted assignments.

(f) Where an escort is required in accordance with paragraph (c), (d), or (e) of this section, the escort shall:

(1) Have completed required training, examinations, and performance demonstrations for the area to be entered and the work to be performed; and

(2) Ensure that all escorted individuals comply with the documented radiation protection program.

(g) Retraining shall be provided to individuals when there is a significant change to radiation protection policies and procedures that may affect the individual and at intervals not to exceed 24 months. Retraining provided for individuals subject to the requirements of § 835.901(d) and (e) shall include successful completion of an examination.

§§ 835.902 and 835.903 [Removed and Reserved]

31. Sections 835.902 and 835.903 of subpart J are removed and reserved.

Subpart K—Design and Control

32. In § 835.1001, paragraph (a), the phrase in the first sentence ''facility and equipment design'' is revised to read ''physical design features'' and paragraph (c) is added as follows:

§ 835.1001 Design and control.

* * * * *

(c) During the design of new facilities or modification of existing facilities:

(1) Optimization methods shall be used to assure that occupational dose is maintained ALARA in developing and justifying facility design or modification and physical controls; and

(2) The design or modification of a facility and the selection of materials shall include features that facilitate operations, maintenance, decontamination, and decommissioning.

33. Section 835.1002 is removed and reserved.

§ 835.1002 [Removed and Reserved]

34. Section 835.1003 is amended by revising paragraph (a)(1); removing paragraph (a)(2); and redesignating paragraph (a)(3) as paragraph (a)(2):

§ 835.1003 Control procedures.

(a) * * *

(1) The anticipated occupational dose to general employees shall not exceed the limits established in § 835.202; and

* * * * *

Subpart L—Releases of Materials and Equipment From Radiological Areas

35. Section 835.1101 is revised to read as follows:

§ 835.1101 Releases of materials and equipment from radiological areas.

The following requirements apply to the release of materials and equipment from radiological areas for use in controlled areas:

(a) Except as provided in paragraphs (b) and (c) of this section, in radiological areas established to control surface or airborne radioactive material, material and equipment shall be treated as radioactive material and shall not be released from radiological areas to controlled areas if either of the following conditions exist:

(1) Surveys of accessible surfaces show that either the total or removable contamination levels exceed the values specified in appendix D to this part; or

(2) Prior use suggests that the contamination levels on inaccessible surfaces are likely to exceed the values specified in appendix D to this part.

(b) Material and equipment exceeding the total or removable surface radioactivity values specified in appendix D to this part may be conditionally released for movement on-site from one radiological area for immediate placement in another radiological area only if appropriate surveys are performed and appropriate procedures to control the movement are established and exercised.

(c) Material and equipment with fixed contamination levels that exceed the values specified in appendix D to this part may be released for use in controlled areas outside of the radiological areas only under the following conditions:

(1) Removable contamination levels are below the values specified in appendix D to this part; and

(2) Materials are routinely surveyed and clearly marked, labeled, or tagged to alert individuals of the contaminated status; and

(3) Appropriate written procedures are established and exercised to maintain control of these items.

(d) Prior to removal of materials and equipment from radiological areas in accordance with paragraph (a) of this section, all radioactive material markings and labels shall be removed or defaced.

Subpart M—Sealed Radioactive Source Control

36. Subpart M is amended by adding sections 835.1201 and 835.1202 as follows:

§ 835.1201 General provisions.

(a) Written procedures shall be established and implemented to control accountable sealed radioactive sources.

(b) Accountable sealed radioactive sources, or their storage containers or devices, shall be labeled in accordance with § 835.605. Such labels are exempt from the design and color specifications of § 835.601(b).

§ 835.1202 Inventories and leak tests.

(a) Each accountable sealed radioactive source shall be inventoried at intervals not to exceed six months. This inventory shall:

(1) Establish the physical location of each accountable sealed radioactive source;

(2) Verify the presence and adequacy of associated postings and labels; and

(3) Establish the adequacy of storage locations, containers, and devices.

(b) Except for sealed sources consisting solely of gaseous radioactive material or tritium, each accountable sealed radioactive source having an activity in excess of 0.005 μCi shall be subject to a source leak test upon receipt, when damage is suspected, and at intervals not to exceed six months. Source leak tests shall be capable of detecting radioactive material leakage equal to or exceeding 0.005 μCi.

(c) Notwithstanding the requirements of paragraph (b) of this section, an accountable sealed radioactive source is not subject to periodic source leak testing if that source has been removed from service. Such sources shall be stored in a controlled location, subject to periodic inventory as required by paragraph (a) of this section, and subject to source leak testing prior to being returned to service.

(d) Notwithstanding the requirements of paragraph (b) of this section, an accountable sealed radioactive source is not subject to periodic inventory and source leak testing if that source is located in an area that is unsafe for human entry.

(e) An accountable sealed radioactive source found to be leaking radioactive material shall be controlled in a manner that prevents the escape of radioactive material to the workplace.

37. In § 835.1301, paragraphs (b) and (d) are amended by removing the phrase ''or 835.205'' and the introductory text of paragraph (a) is revised as follows:

§ 835.1301 General provisions.

(a) A general employee whose occupational dose has exceeded the numerical value of any of the limits specified in § 835.202 as a result of an accident or emergency may be permitted to return to work in radiological areas

during the current year providing that all of the following conditions are met:

* * * * *

38. Section 835.1302, paragraph (c) is revised to read as follows, paragraph (d) is removed, and paragraph (e) is redesignated as (d) and revised to read as follows:

§ 835.1302 Emergency exposure situations.

* * * * *

(c) No individual shall be required to perform rescue action that might involve substantial personal risk.

(d) Each individual selected shall be trained in accordance with § 835.901(d) and briefed beforehand on the known or anticipated hazards to which the individual will be subjected.

§ 835.1304 [Amended]

39. In § 835.1304, paragraphs (a) and (b)(1), the word ''personnel'' is revised to read ''individuals''; in paragraph (b)(4), the phrase ''all personnel'' is revised to read ''individuals''.

40. Appendix A to Part 835 is amended by removing footnote 5 and adding the following paragraph at the beginning of the introductory text:

Appendix A to Part 835—Derived Air Concentrations (DAC) for Controlling Radiation Exposure to Workers at DOE Facilities

The data presented in appendix A are to be used for determining individual internal doses in accordance with § 835.209, identifying the need for air monitoring in accordance with § 835.403, and identifying airborne radioactivity areas as defined in § 835.2(a).

* * * * *

41. Appendix B to Part 835 is removed and reserved.

42. Appendix C to Part 835 is amended by removing the entries for the radionuclides Rn-220 and Rn-222 and their corresponding half-lives and air immersion DACs from the table and revising the introductory text preceding the table as follows:

Appendix C to Part 835—Derived Air Concentration (DAC) for Workers From External Exposure During Immersion in a Contaminated Atmospheric Cloud

a. The data presented in appendix C are to be used for identifying airborne radioactivity areas as defined in § 835.2(a), determining individual internal doses in accordance with § 835.209, and identifying the need for air monitoring in accordance with § 835.403.

b. The air immersion DAC values shown in this appendix are based on a stochastic dose limit of 5 rems (0.05 Sv) per year or a nonstochastic (organ) dose limit of 50 rems (0.5 Sv) per year. Four columns of information are presented: (1) radionuclide; (2) half-life in units of seconds (s), minutes (min), hours (h), days (d), or years (yr); (3) air immersion DAC in units of μCi/ml; and (4) air immersion DAC in units of Bq/m^3. The data are listed by radionuclide in order of increasing atomic mass. The air immersion DACs were calculated for a continuous, nonshielded exposure via immersion in a semi-infinite atmospheric cloud. The DACs listed in this appendix may be modified to allow for submersion in a cloud of finite dimensions.

c. The DAC value for air immersion listed for a given radionuclide is determined either by a yearly limit on effective dose equivalent, which provides a limit on stochastic radiation effects, or by a limit on yearly dose equivalent to any organ, which provides a limit on nonstochastic radiation effects. For most of the radionuclides listed, the DAC value is determined by the yearly limit on effective dose equivalent. Thus, the few cases where the DAC value is determined by the yearly limit on shallow dose equivalent to the skin are indicated in the table by an appropriate footnote. Again, the DACs listed in this appendix account only for immersion in a semi-infinite cloud and do not account for inhalation or ingestion exposures.

d. Three classes of radionuclides are included in the air immersion DACs as described below.

(1) *Class 1.* The first class of radionuclides includes selected noble gases and short-lived activation products that occur in gaseous form. For these radionuclides, inhalation doses are negligible compared to the external dose from immersion in an atmospheric cloud.

(2) *Class 2.* The second class of radionuclides includes those for which a DAC value for inhalation has been calculated, but for which the DAC value for external exposure to a contaminated atmospheric cloud is more restrictive (i.e., results in a lower DAC value). These radionuclides generally have half-lives of a few hours or less, or are eliminated from the body following inhalation sufficiently rapidly to limit the inhalation dose.

(3) *Class 3.* The third class of radionuclides includes selected isotopes with relatively short half-lives. These radionuclides typically have half-lives that are less than 10 minutes, they do not occur as a decay product of a longer lived radionuclide, or they lack sufficient decay data to permit internal dose calculations. These radionuclides are also typified by a radioactive emission of highly intense, high-energy photons and rapid removal from the body following inhalation.

e. The DAC values are given for individual radionuclides. For known mixtures of radionuclides, determine the sum of the ratio of the observed concentration of a particular radionuclide and its corresponding DAC for all radionuclides in the mixture. If this sum exceeds unity (1), then the DAC has been exceeded. For unknown radionuclides, the most restrictive DAC (lowest value) for those isotopes not known to be absent shall be used.

* * * * *

43. Appendix D to part 835 is revised as follows:

Appendix D to Part 835—Surface Radioactivity Values

The data presented in appendix D are to be used in identifying contamination and high contamination areas as defined in § 835.2(a), identifying the need for surface contamination monitoring and control in accordance with § 835.404, identifying the need for radioactive material controls in accordance with § 835.1101.

SURFACE RADIOACTIVITY VALUES [1]

[In dmp/100 cm^2 [2]]

Radionuclide	Removable [2, 4]	Total (fixed + removable) [2, 3]
U-nat, U-235, U-238, and associated decay products.	1,000	5,000
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129.	20	500.
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133.	200	1,000.
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above [5].	1,000	5,000.
Tritium and tritiated compounds [6].	10,000	N/A.

[1] The values in this appendix, with the exception noted in footnote 6, apply to radioactive contamination deposited on, but not incorporated into the interior of, the contaminated item. Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides apply independently.

[2] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[3] The levels may be averaged over one square meter provided the maximum surface activity in any area of 100 cm^2 is less than three times the value specified. For purposes of averaging, any square meter of surface shall be considered to be above the surface radioactivity value if: (1) from measurements of a representative number of sections it is determined that the average contamination level exceeds the applicable value; or (2) it is determined that the sum of the activity of all isolated spots or particles in any 100 cm^2 area exceeds three times the applicable value.

[4] The amount of removable radioactive material per 100 cm^2 of surface area should be determined by swiping the area with dry filter or soft absorbent paper, applying moderate pressure, and then assessing the amount of radioactive material on the swipe with an appropriate instrument of known efficiency. (Note—The use of dry material may not be appropriate for tritium.) When removable contamination on objects of surface area less than 100 cm^2 is determined, the activity per unit area shall be based on the actual area and the entire surface shall be wiped. It is not necessary to use swiping techniques to measure removable contamination levels if direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable contamination.

[5] This category of radionuclides includes mixed fission products, including the Sr-90 which is present in them. It does not apply to Sr-90 which has been separated from the other fission products or mixtures where the Sr-90 has been enriched.

[6] Tritium contamination may diffuse into the volume or matrix of materials. Evaluation of surface contamination shall consider the extent to which such contamination may migrate to the surface in order to ensure the surface radioactivity value provided in this appendix is not exceeded. Once this contamination migrates to the surface, it may be removable, not fixed, therefore a ''Total'' value does not apply.

44. Appendix E to Part 835 is added as follows:

Appendix E to part 835—Values for Establishing Sealed Radioactive Source Accountability and Radioactive Material Posting and Labeling Requirements

The data presented in appendix E are to be used for identifying accountable sealed radioactive sources and radioactive material areas as those terms are defined in § 835.2(a) and establishing the need for radioactive material labeling in accordance with §§ 835.605 and 835.606.

Note: The data in this table are listed in order of increasing atomic weight.

Less than 300 μCi (10 MBq)

H-3
Be-7
C-14
S-35
Ca–41
Ca-45
V-49
Mn-53
Fe-55
Ni-59
Ni-63
As-73
Se-79
Rb-87
Tc-99
Pd-107
Cd-113
In-115
Te-123
Cs-135
Ce-141
Gd-152
Tb-157
Tm-171
Ta-180
W-181
W-185
W-188
Re-187
Tl-204

Less than 30 μCi (1 MBq)

Cl-36
K-40
Fe-59
Co-57
Se-75
Rb-84
Sr-85
Sr-89
Y-91
Zr-95
Nb-93m
Nb-95
Tc-97m
Ru-103
Ag-105
In-114m
Sn-113
Sn-119m
Sn-121m
Sn-123
Te-123m
Te-125m
Te-127m
Te-129m
I-125
La-137
Ce-139
Pm-143
Pm-145
Pm-147
Sm-145
Sm-151
Eu-149
Eu-155
Gd-151
Gd-153
Dy-159
Tm-170
Yb-169
Lu-173
Lu-174
Lu-174m
Hf-175
Hf-181
Ta-179
Re-184
Re-186m
Ir-192
Pt-193
Au-195
Hg-203
Pb-205
Np-235
Pu-237

Less than 3 μCi (100 kBq)

Be-10
Na-22
Al-26
Si-32
Sc-46
Ti-44
Mn-54
Fe-60
Co-56
Co-58
Co-60
Zn-65
Ge-68
Rb-83
Y-88
Zr-88
Zr-93
Nb-94
Mo-93
Tc-95m
Tc-97
Tc-98
Ru-106
Rh-101
Rh-102
Rh-102m
Ag-108m
Ag-110m
Cd-109
Sn-126
Sb-124
Sb-125
Te-121m
I-129
Cs-134
Cs-137
Ba-133
Ce-144
Pm-144
Pm-146
Pm-148m
Eu-148
Eu-150
Eu-152
Eu-154
Gd-146
Tb-158
Tb-160
Ho-166m
Lu-176
Lu-177m
Hf-172
Ta-182
Re-184m
Os-185
Os-194
Ir-192m
Ir-194m
Hg-194
Pb-202
Bi-207
Bi-210m
Cm-241

Less than 0.3 μCi (10 kBq)

Sr-90
Cd-113m
La-138
Hf-178m
Hf-182
Po-210
Ra-226
Ra-228
Pu-241
Bk-249
Es-254

Less than 0.03 μCi (1 kBq)

Sm-146
Sm-147
Pb-210
Np-236
Cm-242
Cf-248
Fm-257
Md-258

Less than 0.003 μCi (100 Bq)

Gd-148
Th-228

Th-230
U-232
U-233
U-234
U-235
U-236
U-238
Np-237
Pu-236
Pu-238
Pu-239
Pu-240
Pu-242
Pu-244
Am-241
Am-242m
Am-243
Cm-243
Cm-244
Cm-245
Cm-246
Cm-247
Bk-247
Cf-249
Cf-250
Cf-251
Cf-252
Cf-254

Less than 0.0003 μCi (10 Bq)

Ac-227
Th-229
Th-232
Pa-231
Cm-248
Cm-250

Any alpha emitting radionuclide not listed above and mixtures of alpha emitters of unknown composition have a value of 0.001 μCi.

Any radionuclide other than alpha emitting radionuclides not listed above and mixtures of beta emitters of unknown composition have a value of 0.01 μCi.

Note: Where there is involved a combination of radionuclides in known amounts, derive the value for the combination as follows: determine, for each radionuclide in the combination, the ratio between the quantity present in the combination and the value otherwise established for the specific radionuclide when not in combination. If the sum of such ratios for all radionuclides in the combination exceeds unity (1), then the accountability criterion has been exceeded.

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