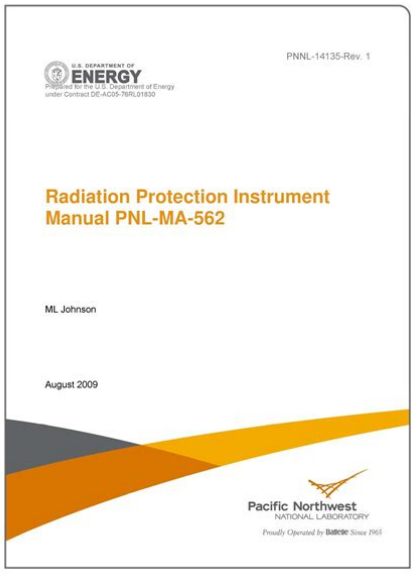
Doe Radiation Protection Manual



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Doe Radiation Protection Manual

The AEA and the statutes that amended it delegate the control of nuclear energy primarily to DOE, the Nuclear Regulatory Commission NRC, and the Environmental Protection Agency EPA. DOE Standards DOESTD11962011, Derived Concentration Technical Standard Complements and supports the implementation of Department of Energy DOE Order 458.1, Radiation Protection of the Public and the Environment. It establishes the numerical values of Derived Concentration technical standards DCSs and new internal dose coefficients for the ingestion of water, inhalations and submersion in air, all in a manner reflecting the current state of knowledge and practice in radiation protection. DOESTD11532019, A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestial Biota. DOE Order 458.1, Radiation Protection of the Public and the Environment, specifies that when actions taken to protect humans from radiation and radioactive materials are not adequate to protect biota, evaluations must be done to demonstrate compliance. DOE STD 11532019, A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota provides a description of the methods, models, and guidance within a graded approach that DOE personnel and contractors may use to characterize radiation doses to aquatic and terrestrial biota that are exposed to radioactive materials. DOE Handbooks ALARA Handbook DOEHDBK12152014 Optimizing Radiation Protection of the Public and the Environment for Use With DOE O 458.1, ALARA The purpose of the ALARA Handbook below is to provide guidance for implementing and complying with the current As low as Reasonably Achievable ALARA requirements of DOE O 458.1, 4.d. for the development and application of a program to keep radiation exposures of the public and releases of radioactive material to the environment from DOE activities as low as is reasonably achievable.http://www.triumphsportprijzen.nl/uploads/casio-ctk-500-manual-download.xml

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That is, an ALARA program means the set of design specifications, operating procedures, techniques, monitoring and surveillance programs, records, and instructions used to implement the ALARA process. ALARA process means a logical procedure for evaluating alternative operations, processes, and other measures, designed to reduce exposures to radiation and emissions of radioactive material into the environment, taking into account societal, environmental, technological, economic, practical, and public policy considerations to make a judgment concerning the optimum level of public health protection. The term radiological protection, is used in this document in the broad sense in that it includes, among other things, the design and operation of those processing components whose function is to remove radioactive material from waste streams which become part of the effluent releases to the environment or to constitute other sources of exposure of members of the public. DOEHDBK12162015; Environmental Radiological Effluent Monitoring and Environmental Surveillance Effluent monitoring and environmental surveillance of radioactive materials are a continuing major part of the radiological protection programs at Department of Energy DOE sites. The purpose of this Handbook is to identify procedures, systems, methods, instruments and practices that may be used to plan and implement radiological effluent monitoring and environmental surveillance that meet the requirements in DOE Order O 458.1, Radiation Protection of the Public and the Environment. Effluent monitoring and environmental surveillance activities, like other DOE activities, present risks and hazards that need to be

considered in planning the work. The focus of this document is on the sampling, monitoring and analysis activities and although not addressed in detail in this Handbook, appropriate job hazard analyses are necessary to ensure worker safety. Under DOE O 458.http://www.cukiernia-waltar.pl/qcms/userfiles/casio-ctk-511-user-manual.xml

1 the approved surface contamination guidelines are presented in Table IV1, DOE O 5400.5 Predecessor of DOE O 458.1 or alternatively Draft DOE G 441.1XX, Implementation Guide Control and Release of Property with Residual Radioactive Materials. National Emission Standards for Hazardous Air Pollutants NESHAP Compliance Monitoring The National Emission Standards for Hazardous Air Pollutants NESHAP is an Environmental Protection Agency EPA standard that is applicable within the United States to the emissions of hazardous air pollutants produced by corporations, institutions and at Agencies at all levels of government. The hazardous air pollutants are those pollutants that are known or suspected to cause cancer, serious health effects, or adverse environmental effects. For the U.S. Department of Energy DOE sites, the EPA regulates radionuclide emissions to air, other than radon, under Subpart H of 40 CFR Part 61. Subpart H requires DOE operations that have the potential to emit radionuclides to ambient air to issue an annual compliance report demonstrating site compliance with the dose standard. It establishes requirements to protect the public and the environment against undue risk from radiation associated with radiological activities conducted under the control of the Department of Energy DOE pursuant to the Atomic Energy Act of 1954, as amended AEA. DOE developed the technical standard DOESTD11532019, A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota, Feb 2019. The Standard provides a graded approach for evaluating radiation doses to aquatic and terrestrial biota. This site provides the different committees and working groups that DOE is involved with. The ASERs provide important information needed by site managers and DOE Headquarters to assess field environmental program performance, sitewide environmental monitoring and surveillance effectiveness, and confirm compliance with environmental standards and requirements.

They are also the means by which DOE sites demonstrate compliance with the radiological protection requirements of DOE O 458.1. In addition, ASERs are an important means of conveying DOEs environmental protection performance to stakeholders and members of the public living near DOE sites. Nonionizing radiation is essential to life, but excessive exposures will cause tissue damage. All forms of ionizing radiation have sufficient energy to ionize atoms that may destabilize molecules within cells and lead to tissue damage. Rule 10 CFR 835 established the Department of Energy’s DOE occupational protection rule and requires assessment and recording of radiation doses to individuals who are exposed to sources of radiation or contamination. Please notify the appropriate people at your site that these following DOE documents are available as a PDF file through the DOE Radiation Safety Training Materials Page.Only occupationally exposed workers are included in the databases. The Rule 10 CFR 835.702 requires annual individual radiation exposure records to be recorded. DOE Order 231.1B requires the reporting of monitoring results to the REMS Repository in accordance with the specifications provided in REMS Reporting Guide. Rutgers University Some links are provided to Web sites outside of this site and should not be considered as an official endorsement or verification of the accuracy of their content. Users are subject to the privacy policies of those sites. It is used by federal agencies and states, site owners, contractors, and the public. MARSSIM was developed collaboratively by the Department of Defense DOD, the Department of Energy DOE, the United States Nuclear Regulatory Commission NRC, and the EPA. It is efficient, practical, and easy to use in the field. It may not be available at this time, the URL may have changed, or we may be experiencing technical problems locating it. If possible, include the resource’s title and the URL that is no longer working.

https://www.informaquiz.it/petrgenis1604790/status/flotaganis12062022-0717

The plan would, in turn, form the basis for development of the implementation procedures that

execute the intent of the plan. 1.4 This guide applies to the development of radiation protection programs established to control exposures to radiation and radioactive materials associated with the decommissioning of nuclear facilities. The intent of this guide is to supplement existing radiation protection programs as they may pertain to decommissioning workers, members of the general public and the environment by describing the basic elements of a radiation protection program for decommissioning operations. 1.5 This guide defines the elements of a radiation protection program that will ensure that the goals and objectives of a decommissioning activity are attained within the radiological limits and restrictions imposed by applicable governing and regulating agencies. The implementation of such a program will provide radiological protection to personnel and the environment. This guide should be used for developing the documentation that defines the intent and implementation of the radiation protection program for a specific decommissioning project. 1.6 The Radiation Protection Program should address the following elements see Note 1 . This program shall be developed and maintained such that it satisfies all applicable Quality Assurance requirements developed for the decommissioning project. Note 1 If the site to be decommissioned is adjacent to an operating site, the radiological impact of the operating site must be considered in the development of the Radiation Protection Program for the decommissioning site. 1.7 This guide does not address the subjects of emergency preparedness, safeguards, accountability, waste handling, storage, and transportation. Each of these issues has a direct interface with the radiation protection program. However, each constitutes a program in and of itself from program definition through implementation. 1.

8 This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. USNRC Regulatory Guide 8.10 Operating Philosophy for Maintaining Occupational Radiation Exposures as Low as Reasonably Achievable. USNRC Regulatory Guide 8.13 Instruction Concerning Prenatal Radiation Exposure. USNRC Regulatory Guide 8.15 Acceptable Programs for Respiratory Protection. USNRC Regulatory Guide 8.29 Instruction Concerning Risk from Occupational Radiation Exposure. USNRC Regulatory Guide 8.8 Information Relevant to Insuring that Occupational Radiation Exposure at Nuclear Power Stations will be as Low as is Reasonably Achievable Available from Nuclear Regulatory Commission, Public Document Room, 1717 H St. NW, Washington, DC 20555. ANSI N13.6 Practice for Occupational Radiation Exposure Records System Available from American National Standards Institute ANSI, 25 W. 43rd St., 4th Floor, New York, NY 10036. ANSI N323AB American National Standard for Radiation Protection Instrumentation Test and Calibration, Portable Survey Instruments DOE Standard 107094 Guidelines for Evaluation of Nuclear Facility Training Programs. We’ve made big changes to make the eCFR easier to use. Be sure to leave feedback using the Help button on the bottom right of each page!The Public Inspection page may alsoWhile every effort has been made to ensure thatUntil the ACFR grants it official status, the XMLCounts are subject to sampling, reprocessing and revision up or down throughout the day. These can be usefulOnly official editions of theUse the PDF linked in the document sidebar for the official electronic format.

The amendment to appendix C corrects the air immersion derived air concentration value for any single radionuclide not listed in the appendix C table with a decay mode other than alpha emission or spontaneous fission and with radioactive halflife less than two hours, adjusted for an 8hr work day. The amendments to appendix E correct the activity information of two radionuclides, Rh102 and Rh102m. Telephone 3019031165.One situation that DOEs regulations address is the exposure of workers to radioactive material dispersed in the air. Based on calculations involving doses to the organs of the body, levels of contamination in the air that will not cause the dose limits for workers to be exceeded are established for specified radionuclides. These values are provided in appendix C

of part 835. On April 13, 2011, the Department published updated Derived Air Concentration DAC values in appendix C for determining radiation dose from inhaled radioactive material 76 FR 20489 . The updated dose conversion factors were determined using International Commission on Radiological Protection ICRP Publication 68 ref. 1 effective dose rates for an 8hour exposure period, instead of the previously assumed 24hour calendar day exposure, which is consistent with other occupational scenarios, such as those used in developing appendix A DACs. The values were then rounded down to the nearest power of 10. In that update, the DAC values for radionuclides not listed in the appendix C table with a decay mode other than alpha emission or spontaneous fission and with radioactive halflife less than two hours were inadvertently not revised for the 8 hour work day exposure time. The amendment to appendix C provides the correct DAC values for this group of radioactive materials. DOE most recently amended the values of appendix E to part 835 on June 8, 2007 72 FR 31904 , using the ICRP Publication 60 methodology ref.

1 and the same exposure scenarios discussed in a 1998 amendment to 10 CFR part 835 63 FR 59662, November 4, 1998. The values were based on the more limiting of the quantity of radioactive material which results in either an external or internal whole body dose, from either inhalation or ingestion, of 100 millirems. However, the final rule incorrectly listed values for two radionuclides. This amendment to appendix E provides the correct activity values for these two radionuclides Rh102 and Rh102m, calculated from internal exposure scenario derived from ICRP Publication 119 ref. 2. All substantive changes from the notice of proposed rulemaking NOPR are explained in this section. DOE did not receive any comments on the proposed amendment to this appendix, which remains unchanged in the final rule. Accordingly, this action was not subject to review under that Executive Order by the Office of Information and Regulatory Affairs OIRA of the Office of Management and Budget OMB. The requirements of part 835 are primarily implemented by contractors who conduct work at DOE facilities. DOE considered whether these contractors are “small businesses” as the term is defined in the Regulatory Flexibility Act 5 U.S.C. 601 3. The Regulatory Flexibility Acts definition incorporates the definition of small business concerns in the Small Business Act, which the Small Business Administration SBA has developed through size standards in 13 CFR part 121. DOE expects that any potential economic impact of this rule would be negligible because DOE activities are conducted by contractors who are reimbursed through their contracts with DOE for the costs of complying with DOE nuclear safety and radiation protection requirements, including the costs of complying with the rule. For these reasons, DOE certifies that this rule, will not have a significant economic impact on a substantial number of small entities, and therefore, no regulatory flexibility analysis has been prepared.

DOEs certification and supporting statement of factual basis will be provided to the Chief Counsel of Advocacy of the SBA pursuant to 5 U.S.C. 605 b. Accordingly, neither an environmental assessment nor an environmental impact statement is required. Section 3b2 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, to be given to the regulation; 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, to be given to the regulation; 5 defines key terms; and 6 addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. Section 3c of Executive Order 12988 requires Executive agencies to review regulations in light of applicable standards in section 3a and section 3b to determine whether they are met or it is unreasonable to meet one or more of the standards. DOE has completed the required review and determined that, to the extent permitted by law, this final rule meets the relevant standards of Executive Order 12988. Agencies are required to examine the constitutional and statutory authority supporting any action that would limit the policymaking discretion of the States and carefully assess the necessity for such actions. DOE has examined this rule and has determined that it will not

preempt State law and will not have a substantial direct effect on the States, the relationship between the national government and the States, or the distribution of power and responsibilities among the various levels of government. No further action is required by Executive Order 13132. DOE has determined that the proposed rule will not have such effects and concluded that Executive Order 13175 does not apply to this final rule.

The Act also requires a Federal agency to develop an effective process to permit timely input by elected officials of state, tribal, or local governments on a proposed "significant intergovernmental mandate," and requires an agency plan for giving notice and opportunity to provide timely input to potentially affected small governments before establishing any requirements that might significantly or uniquely affect small governments. DOE has determined that the final rule published does not contain any Federal mandates affecting small governments, so these requirements do not apply. A "significant energy action" is defined as any action by an agency that promulgated or is expected to lead to promulgation of a final rule, and that 1 Is a significant regulatory action under Executive Order 12866, or any successor order; and 2 is likely to have a significant adverse effect on the supply, distribution, or use of energy, or 3 is designated by the Administrator of OIRA as a significant energy action. For any proposed significant energy action, the agency must give a detailed statement of any adverse effects on energy supply, distribution, or use should the proposal be implemented, Start Printed Page 37514 and of reasonable alternatives to the action and their expected benefits on energy supply, distribution, and use. This regulatory action will not have a significant adverse effect on the supply, distribution, or use of energy and is therefore not a significant energy action. Accordingly, DOE has not prepared a Statement of Energy Effects. The rule will not have any impact on the autonomy or integrity of the family as an institution. Accordingly, DOE has concluded that it is not necessary to prepare a Family Policymaking Assessment. DOE has reviewed this rule under the OMB and DOE guidelines and has concluded that it is consistent with applicable policies in those guidelines.

The report will state it has been determined that the rule is not a "major rule" as defined by 5 U.S.C. 804 2. Dose Coefficients for Intakes of Radionuclides by Workers. ICRP Publication 68. Ann. ICRP 24 4. Some enhanced features will not be available until JavaScript is enabled.Radiation machines are used by dentists and veterinarians, and in hospitals, mammography facilities, and other medical, academic and industrial facilities. Radioactive materials are used primarily by radiologists in hospital nuclear medicine units, but also by other qualified physicians and radiographers and qualified radioisotope users in the manufacturing and construction industries, academia and other authorized locations. There are more than 5,100 radiation machine facilities housing 15,000 xray tubes, and nearly 550 radioactive material licensees in Maryland. Additionally, more than 150 Out of State radioactive materials users on average may work in Maryland for limited periods of time under reciprocal recognition of their Agreement State or NRC license after applying for and receiving approval from the RHP. Designated radiation staff health physicists also respond to any industrial, medical or transportation radiation accident or serious incidents involving radiation. The general public and the environment are at risk if the users and handlers of radioactive materials and radiation producing electronic devices fail to recognize potential radiation hazards or follow proper radiation safety practices and procedures. The RHP also certifies the performance of medical, industrial and academic electronic radiation machines following inspection by Statelicensed inspectors, and performs inspections of State mammography facilities under contract with the federal Food and Drug Administration. Facilities that use radioactive materials are issued licenses and are inspected on set schedules by the RHP to determine whether the facility is using proper safety procedures.

Inspections are also performed on selected out of state radioactive materials users operating under reciprocity. Prior to submitting forms, please call the RHP at 410 5373300 so that we may direct you

to the correct unit or staff member. Forms are available in Adobe Acrobat .pdf format. To view the Adobe Acrobat forms, users will need to download the Adobe Acrobat Reader. FHPS, CHP Director. Radiation Safety Counseling Institute Is Your Radiation Instrument Telling You What You Think it Is. They are intended to be a source reference for professionals working in these subjects. Radiation related sites of interest to the lay reader may be found at Radiation Perspectives. Health physics resources from the Oak Ridge Associated Universities. Oak Ridge Associated Universities ORAU.Museum of historical radiation detection instrumentation and all things radioactive. Idaho State Universitys radiation web site. Radiation safety and environmental consulting. UK based information resource on nuclear power. NRC Source. NRC Source. Specifies requirements for decommissioning plans. September 2000. NRC Source. As Low As Reasonably Achievable ALARA.Decommissioning Process for Materials Licensees. Revision 2. September 2006. NRC Source. Characterization, Survey, and Determination of Radiological Criteria. Revision 1. September 2006. NRC Source. Financial Assurance, Record Keeping and Timliness. NRC Source. Withdrawn by NRC on August 12, 2016. NRC Source. It is the Departments objective to operate its facilities and conduct activities so that radiation exposures to members of the public and the environment are maintained as low as is reasonably achievable ALARA, within limits established in DOE O 458.1, Radiation Protection of the Public and the Environment. DOE policies, standards and guidance that supports or helps implement DOE O 458.1, Radiation Protection of the Public and the Environment. DOE source. Superseded by DOE O 458.1 Supersedes DOE Order 5400.5.

It establishes requirements to protect the public and the environment against undue risk from radiation associated with radiological activities conducted under the control of the DOE pursuant to the Atomic Energy Act of 1954, as amended. DOE source. This standard supports the implementation of DOE Order 458.1, Radiation Protection of the Public and the Environment. It also establishes the numerical values of DCSs in a manner reflecting the current state of knowledge and practice in radiation protection. DOE source. This technical standard provides methods, models, and guidance within a graded approach that the DOE and its contractors may use to evaluate doses of ionizing radiation to populations of aquatic animals, terrestrial plants, and terrestrial animals from DOE activities for the purpose of demonstrating protection relative to Dose Rate Guidelines. DOE source. Radiation Protection of the Public and Environment. The occupational radiation protection program is governed by 10 CFR 835. Elements include assessing external and internal doses, workplace monitoring, radiological equipment, and radiation dose reporting. Doses are required to be ALARA as low as reasonably achievable and must not exceed the limits given in 10 CFR 835. The Occupational Radiation Exposure website provides the most currently available information on radiation exposure to personnel at DOE facilities. The Radiation Exposure Monitoring System REMS database is the radiation exposure data repository for all monitored DOE employees, contractors, subcontractors and members of the public. Federal source. DOE source. DOE source. August 1997. EPA Source. September 1994. EPA Source. Soil cleanup levels based on theoretical 1E6 risk level.PRG Home PRG Calculator DCC Home DCC Calculator Interior building cleanup goals based on theoretical 1E6 risk level. Exterior hard surface cleanup goals based on theoretical 1E6 risk level. EPA Source. Release of materials and equipment using MARSSIMtype protocols.

EPA Source. LARW are informally defined as radioactive wastes that contain very small concentrations of radionuclides. The concentrations are small enough that protection of public health and the environment from these wastes may not require all of the radiation protection measures necessary to manage higheractivity radioactive material. At this time, “lowactivity” itself is a concept, not a definition. On November 18, 2003, EPA published an Advance Notice of Proposed Rulemaking ANPR to collect public comment on alternatives for disposal of waste containing low concentrations of radioactive material “lowactivity” waste. EPA worked with the Department of Energy DOE, the Nuclear Regulatory Commission NRC and NRC Agreement States in developing the ANPR. EPA Source. EPA cancer isk modeling utilizing the Blue book and FRG 13.EPAs Federal

Guidance for Radiation Ptotection Protective Action Guides for Strontium89, Strontium90, and Cesium137. 1965. EPA source. Cancer Risk Coefficients from Environmental Exposure to Radionuclides. 1999. EPA source. RADIATION STANDARDS Scientific Basis Inconclusive, and EPA and NRC Disagreement Continues. July 18, 2000 Resource of organizations, activities, and technical terminology related to radioactive contamination. December 1999. ITRC source. Summaries of the various regulatory standards and requirements that dictate cleanup at radioactively contaminated sites, discussion of processes used to develop cleanup levels, and case studies from 12 selected sites to demonstrate variations in the decisionmaking framework and basis. April 2002. ITRC source. Presents the results of the survey of state regulator perspectives on longterm stewardship. July 2004. ITRC source. Provides overview of the benefits of a streamlined data collection approach that has proven effective at radionuclide contaminated sites. February 2006. ITRC source. January 2008. ITRC source. If you have a favorite resource thats not included in the list, please let us know.

The MARSSIM is a multiagency consensus document NAREL provides services to other EPA offices, Federal and State agencies, and, in some cases, the private sector OAR develops national programs, technical policies, and regulations for controlling air pollution and radiation exposure This website provides detailed information to the various programs associated with radiation protection activities. RadTown USA is a virtual community showing the wide variety of radiation sources commonly encountered in everyday life. The RadTown site features houses, a school, stadium, construction site, flying plane, moving train and much more to highlight and explain the many common sources of radiation. The FERN structure is organized to ensure federal and state interagency participation and cooperation in the formation, development, and operation of the network. The website contains points of contact and other information links about the network. For major radiological emergencies impacting the United States, the U. S. Department of Energy is responsible for establishing a Federal Radiological Monitoring and Assessment Center FRMAC. The center is the control point for all federal assets involved in the monitoring and assessment of offsite radiological conditions. FRMAC responsibilities are to provide support to the affected states, respond to the assessment needs of the lead federal agency, and meet the statutory responsibilities of the participating federal agency. The NCI, established under the National Cancer Act of 1937, is the Federal Governments principal agency for cancer research and training. The National Cancer Institute coordinates the National Cancer Program, which conducts and supports research, training, health information dissemination, and other programs with respect to the cause, diagnosis, prevention, and treatment of cancer, rehabilitation from cancer, and the continuing care of cancer patients and the families of cancer patients.