Ohio Administrative Code

Rule 3701:1-54-03 Assured isolation facility.

Effective: November 14, 2022

(A) This rule covers the licensing of the storage and safe isolation of licensable radioactive waste, and not disposal of such waste as delineated in rules 3701:1-54-06 to 3701:1-54-12 of the Administrative Code, over the term of a license prior to disposal in accordance with Chapter 3701:1-38 of the Administrative Code, and other rules promulgated under Chapter 3748. of the Revised Code. The requirements of this rule are in addition to those in Chapters 3701:1-40, 3701:1-44 and 3701:1-56 of the Administrative Code, and other rules pursuant to Chapter 3748. of the Revised Code. The requirements of this rule apply to all generators of radioactive waste, and those that store radioactive waste, as follows:

(1) All of the requirements of this rule apply to an assured isolation facility (AIF) used by more than one licensee to hold radioactive waste for storage or any radioactive waste generator who proposes to store radioactive waste at a location other than their currently licensed facility.

(2) Licensees that continue to hold only their own radioactive waste beyond a five year period at their currently licensed facility shall apply for a license to operate an AIF and must comply with paragraphs (B), (C)(1), (C)(2), (C)(4), (C)(5), (C)(7), (C)(9), (D)(3), (D)(4), and (E) to (N) of this rule. Licensees undergoing license termination in accordance with rules 3701:1-38-22 and 3701:1-40-18 of the Administrative Code, or are undergoing decommissioning under an approved decommissioning plan in place as of the date of this rule, are exempt from the licensing requirements of this rule.

(3) Notwithstanding the requirements of paragraph (A)(2) of this rule, licensees that demonstrate a need to hold their own radioactive waste beyond a five year period at their currently licensed facility may apply for an amendment to the license under which the waste is currently stored. The license amendment will be based on the licensee's needs, but will not permit storage beyond a total of ten years from the date that the waste was generated. The amendment may be approved if the director finds that the licensee (a) provides good cause for the need for the extension, (b) demonstrates that the waste will continue to be safely stored during the extension, and (c) submits a planned schedule

for the disposition of the waste.

(B) The performance objectives of an AIF are to:

(1) Protect the environment, the general public, and workers from unnecessary exposures to ionizing radiation.

(2) Keep radioactive material secure from unauthorized access or removal.

(3) Protect the waste and containers from the adverse effects of environmental conditions, including, but not limited to, temperature, humidity, and water.

(4) Use sound engineering designs and prudent procedural practices to maintain doses to workers and the general public, and radionuclide releases to the environment as low as reasonably achievable.

(5) Ensure the individual storage containers are individually inspectable and readily retrievable.

(C) The contents of a license application shall provide sufficient information on the AIF, its operators, and the types of waste held, to provide reasonable assurance that the performance objectives will be met. As a minimum, the applicant shall do the following:

(1) Submit a license application pursuant to Chapter 3701:1-40 of the Administrative Code.

(2) Provide a description of the licensed operating activities requested, including, but not limited to:

(a) The location of the proposed site;

(b) The licensed activities involving the transportation, storage, and handling of radioactive waste;

(c) The types, chemical and/or physical forms and quantities of radioactive waste to be received, possessed, and stored;

(d) The proposed time schedules for construction and receipt of radioactive waste at the proposed

AIF; and

(e) The estimated maximum amount of radioactive waste to be stored, both in terms of volume and activity, by radionuclide.

(3) Describe the site suitability for storage of licensed radioactive materials for each of the following categories.

(a) Describe and justify the location of the AIF in terms of land use. Include in the description the nearby structures present, local land usage, local populations, public facilities, local roads and traffic.

(b) Define the characteristics of the site by identifying and describing applicable portions of paragraph (D)(1) of this rule.

(c) Provide a description of the site radiological environmental monitoring program to meet the criteria in paragraph (I) of this rule. Include baseline information for the data to be collected.

(d) Provide an environmental assessment report required by Chapter 3701:1-40 of the Administrative Code.

(4) Provide a complete description of the AIF, including drawings, to meet the applicable criteria of paragraphs (D) and (E) of this rule.

(5) Submit details on the operation of the AIF covering the topics listed in paragraph (F) of this rule.

(6) Provide a description of the community awareness and communication program to be used.

(a) Identify the means of communication, types of information to be provided, and when the information will be provided to:

(i) Notify the community of the proposed operation and licensing; and

(ii) Maintain community input on operational status, operational changes, and off-site emergency

response capacity.

(b) Identify how the effectiveness of the communications will be monitored and ensured.

(7) Submit any applicable decommissioning funding plan and financial assurance in accordance with Chapter 3701:1-40, Chapter 3701:1-44 or Chapter 3701:1-56 of the Administrative Code.

(8) Submit an emergency response plan in accordance with Chapter 3701:1-40 of the Administrative Code.

(9) Submit the quality assurance program used in accordance with rule 3701:1-54-04 of the Administrative Code to ensure that the maintenance and operation of the AIF meets the performance objectives, is consistent with the contents of the license application, and satisfies the requirements for the receipt, handling, emplacement and retrieval of waste in this rule.

(D) The design of an AIF shall provide reasonable assurance that the radioactive waste will maintain its integrity and remain isolated from the environment as intended.

(1) The overall hydrogeologic environment of the site, in combination with engineering design, shall act to minimize and control potential radioactive waste migration into surface water and ground water in the event of an accidental release. Identification and consideration of the hydrogeologic environment shall include, but is not limited to:

(a) Upstream drainage features such as the potential for frequent ponding and slope stability;

(b) Characteristics of nearby rivers, streams, wetlands, or other bodies of water;

(c) Distance to, and nature of, the water table and aquifer;

(d) Analysis of earthquake potential or other land movement and its consequences;

(e) The proximity to creeks or culverts; and

(f) Soil types under the AIF with respect to compatibility with the foundation and structural design.

(2) No new AIF shall be located:

(a) In a one-hundred year flood plain or a wetland; or

(b) In the recharge area of a sole source aquifer unless it can be demonstrated with reasonable assurance the new AIF will be designed, constructed, operated, and decommissioned without an unreasonable risk to the aquifer.

(3) The AIF shall be constructed as designed to:

(a) Safely handle and store the waste commensurate with the characteristics of the waste;

(b) Aid in fire suppression, provide filtered air ventilation, maintain environmental controls, and to the extent possible be constructed of nonflammable building materials;

(c) Store waste such that each individual waste container is readily retrievable and inspectable; and

(d) Be made of materials, and use methods, considered to ease future decontamination and decommissioning efforts.

(4) The AIF shall include design features to aid in keeping the radioactive waste isolated. The design features must:

(a) Minimize water infiltration and prevent any waste container from contact with water.

(b) Preserve the structural integrity of each waste container.

(c) Ensure that the site drainage and slope stability preserves the integrity of the AIF's foundation.

(d) Ensure that the AIF shall meet the standards prescribed in ASCE/SEI 7-10 "Minimum Design Loads for Buildings and Other Structures" (3rd printing, 2013) for a Category II facility as defined in

the standard. This publication may be purchased from the "American Society of Civil Engineers, 1801 Alexander Bell Drive, Reston, Virginia 20191-4400, telephone (800) 548-2723," or this publication can be viewed at "the Bureau of Environmental Health and Radiation Protection library, 246 N. High Street Columbus, Ohio 43215." Facilities that will have containers exceeding a Type A Quantity of radioactive material in normal form, as defined in Chapter 3701:1-50 of the Administrative Code, must meet the criteria for a category III facility as defined in the standard.

(e) Minimize occupational and non-occupational exposures.

(f) Provide for site and effluent monitoring as appropriate for the AIF.

(g) Ensure that buildings and areas used for the storage of radioactive wastes shall have appropriate ventilation and fire protection systems to minimize the release of radioactive materials into the soil, water, or atmosphere.

(h) Provide facilities and equipment for repackaging leaking or damaged containers.

(i) Ensure that the design and operation of the radioactive waste storage area shall be such that radiation levels, concentrations, and potential exposures due to airborne releases during operations are within the limits specified in Chapter 3701:1-38 of the Administrative Code and are maintained as low as reasonably achievable (ALARA).

(j) Ensure that the design and operation of the AIF shall be compatible with the objectives of the decommissioning funding plan for the AIF.

(k) Ensure that the AIF shall be designed to confine spills. Independent and diverse engineering barriers shall be provided as necessary to minimize potential releases from the AIF.

(E) The applicant shall provide a description of the site and accurate drawings of the AIF. The descriptions shall address the following features, and any design features used in support of the performance objectives:

(1) Describe the ventilation system and how it will ensure adequate environmental controls of the

storage area, including, but not limited to, heating, cooling, and humidity. Describe any applicable exhaust air filtration used.

(2) Describe the fire protection and suppression system to minimize the likelihood and extent of fire.

(3) Describe any plumbing, pipes, and/or wiring that goes through the storage or handling areas.

(4) Describe the physical security of the radioactive waste areas and the AIF. Include how acts of sabotage or deliberate attacks, and the consequences thereof, will be minimized.

(5) Identify radioactive waste storage areas, demonstrating where radioactive waste will be stored and how radioactive waste containers will be accessible for routine inspections.

(6) Describe the locations of radioactive waste handling areas, air sampling stations, effluent filters and any sources of flammable or explosive material.

(7) Provide a description and accurate drawing of any required special handling equipment to be employed.

(8) Describe the equipment installed to maintain control over the maximum concentrations of radioactive materials in gaseous and liquid effluents produced during normal operation and the means employed to keep levels of radioactive material in effluents to unrestricted areas ALARA.

(9) Describe the building codes and standards applied to the design and construction of the AIF.

(10) Describe the AIF construction, including, but not limited to, the building materials and method of construction. Submit copies of required building and zoning permits.

(11) Describe the activity, volume, classification and specifications of the radioactive material to be received, possessed, and stored at the AIF.

(F) The applicant shall describe the operations of the AIF in accordance with the radioactive waste procedures to meet the performance objectives.

(1) Describe the procedures to secure radioactive materials from unauthorized access and removal, including the control of access to the AIF. Include how acts of sabotage or deliberate attacks, and the consequences thereof, will be minimized.

(2) The commingling of radioactive wastes from different generators into a single waste container is prohibited. Describe the procedures used to verify this requirement is met.

(3) Describe the radiation safety program for control and monitoring of radioactive effluents to ensure compliance with the occupational radiation exposure limits, and to control contamination of personnel, vehicles, equipment, buildings, and the AIF. Routine operations, inadvertent releases, and accidents must be addressed. The program description must include procedures, instrumentation, facilities, and equipment.

(4) Submit the procedures for receipt and acceptance of waste packages. The procedures shall include examination of shipping documents, visual check of waste package, survey for removable contamination and external radiation level, identification of packages requiring remediation, corrective actions, and disposition of unacceptable packages.

(5) Describe the program for safe placement and inspection of waste in storage and maintaining occupational exposures ALARA. The program should include periodic radiation and contamination surveys of individual packages and the storage area in general, as well as posting the storage area.

(6) Describe the system for maintaining accurate records of radioactive materials and a current inventory of radioactive waste.

(7) Characterize the radioactive waste to be stored in terms of:

(a) Volume of waste by class A, B, or C as defined in rule 3701:1-54-10 of the Administrative Code; and

(b) Physical form of the waste: solid, liquid, or gas.

(8) The AIF operator shall describe:

(a) The packages or containers to be used for storage of radioactive waste, any hazards the waste may pose to the packaging integrity, and the projected storage life of the packaging or containers;

(b) The program for periodic inspections of radioactive waste packages to ensure that they retain their integrity and containment of radioactive waste; and

(c) The procedures and equipment used for remote handling and repackaging damaged or leaking waste containers.

(9) Provide the following descriptions of the equipment and procedures:

(a) Provide a flow diagram of radioactive waste receipt and storage operations.

(b) Describe the equipment and procedures used to maintain control over on-site exposures to and releases of radioactive material. Include monitoring methods, containment mechanisms, accident mitigation methods and procedures, and the corrective action process used when deviations are discovered.

(c) Describe the spill detection equipment and cleanup plans for the site and associated transportation of radioactive material.

(10) Provide a description of the site radiological environmental monitoring program to meet the criteria in paragraph (I) of this rule. Include baseline information for the data to be collected.

(11) Provide a description of the personnel training and retraining program.

(12) Each licensee shall have emergency response procedures for radionuclide incidents.

(a) If an emergency response plan is required in paragraph (C)(8) of this rule, the applicant shall provide all offsite emergency response organizations that would respond in the event of an accident a copy of the plan and allow sixty days to comment on the applicant's emergency response plan prior

to submitting the plan to the director.

(b) The applicant shall submit copies of any comments received during the comment period to the director with the emergency response plan.

(13) Describe the system for maintaining inventory of receipt, storage, and transfer of radioactive waste.

(14) Describe the disposition of radioactive material and the AIF upon termination of the license.

(G) To meet the radiation safety requirements the following must be met:

(1) The safety manual shall include a description of personnel monitoring methods, training and procedures to be followed to prevent employees from ingesting or inhaling radioactive materials, and methods to keep radiation exposures ALARA;

(2) The operating manual shall include procedures to protect the integrity of the waste and waste containers during normal handling and storage conditions, and shipping radioactive materials;

(3) An emergency response manual shall include procedures to address likely minor and major accident conditions, incident response command structures, and a description of procedures for responding to emergencies, including notification of and coordination with local fire, police and medical departments;

(4) The radiation safety program shall incorporate the requirements of Chapters 3701:1-38 and 3701:1-40 of the Administrative Code, and include topics on the ALARA policy, radiation safety procedures, training, ventilation systems, air sampling, contamination control, internal exposure control and assessments, external exposure control, and instrumentation used; and

(5) The applicant shall describe the program for training personnel in procedures for packaging, handling, placement, inspection, surveying and emergency response for radioactive waste storage and transportation.

(H) Radioactive waste and materials are to be transported, handled, and stored in a safe manner to meet the performance objectives in paragraph (B) of this rule.

(1) Radioactive waste shall contain only class A, B, or C waste, determined by radionuclide activity and concentration, as provided in rule 3701:1-54-10 of the Administrative Code.

(2) Radioactive waste shall meet the waste characteristics of rule 3701:1-54-10 of the Administrative Code.

(3) No individual waste container dose rate shall exceed one-tenth mSv/hr (ten mrem/hr) at one meter or two mSv/hr (two hundred mrem/hr) on the surface.

(4) The radioactive waste shall be secured from unauthorized access and removal by individuals, and maintained to prevent unintentional releases to the environment.

(I) A radiological environmental monitoring program shall be developed and used to measure and monitor radionuclides in all pathways to individuals and the general public from licensed radiological operations. All applicants shall:

(1) Describe the environmental monitoring program to provide data to evaluate potential health and environmental impacts in support of the performance objectives.

(2) Describe the action levels of radionuclides in the environment that will initiate an investigation or corrective action.

(3) Describe the plan for additional monitoring in the event of an unintentional release of radionuclides.

(J) Records and reports shall be developed and maintained in accordance with Chapters 3701:1-38, 3701:1-40, and other chapters of the Administrative Code promulgated pursuant to Chapter 3748. of the Revised Code, and the following:

(1) The licensee shall prepare and send statements to each generator of their own waste status,

including but not limited to volume, radionuclides, activity, waste container condition, regarding prior year inventory balances, additions and withdrawals of waste from the AIF, and final inventory balance. Both the licensee and the generator shall retain copies of these reports for three years.

(2) The licensee shall prepare and send an annual summary report to the director and publish a local notice of the report's availability to the public. The report shall include, at a minimum, a summary of waste in the AIF (prior year inventory balances, additions, withdrawals, and final balances), capacity utilization (volume and radionuclide license limits), incidents, environmental monitoring results, radionuclide releases to the environment, and a fiscal annual report. The licensee shall retain copies of these reports until the license has been terminated.

(3) The annual report to the generators and the annual summary report shall be completed and submitted to the director within sixty days after the end of the calendar year.

(K) The institutional requirements include:

(1) The radioactive materials will remain under active licensee control throughout the term of the license so that the licensee performs an environmental monitoring program, maintains surveillance and custodial care of the radioactive materials and the facility, and satisfies other requirements as determined by the director.

(2) The generator of the radioactive waste shall retain title to the waste.

(3) The generator is responsible for the radioactive waste as shipped, including but not limited to the original containers and contents delivered, waste form, and radionuclide identification and quantification. The AIF operator is responsible for the waste handling and storage conditions after acceptance of the waste until its ultimate disposition.

(4) Each generator shall issue an irrevocable trust to the AIF operator to cover the cost of disposal in the event that the generator becomes bankrupt. The AIF operator must submit a copy of each trust agreement to the director. Each trust shall be reviewed and updated every five years.

(L) Financial assurance, decommissioning, and license termination requirements include:

(1) The licensee shall meet the applicable financial assurance and decommissioning requirements for unrestricted release in rules 3701:1-38-22 and 3701:1-40-17 of the Administrative Code.

(2) The AIF shall return radioactive materials to the generator or generator's designee upon the AIF's failure to renew a license or prior to license termination.

(3) In the event that the AIF cannot meet the financial assurance requirements as determined by the director, the waste held must be returned to the generators or their designees within ninety days after determination that the licensee financial assurance cannot be met.

(M) The limitations placed on an AIF include:

(1) Each license will place limitations on the aggregate radioactive waste volume as well as radionuclide quantities.

(2) An AIF license shall be renewed in accordance with Chapter 3701:1-40 of the Administrative Code. During the license renewal process, an existing licensed AIF shall verify compliance with the originally licensed structural design for the originally licensed usage. Any changes from the originally licensed usage or structural design will require a reevaluation of the entire AIF based on current standards.

(3) All users of the AIF shall contractually agree to the return of the radioactive waste to the generator, or transfer to the generator's designee licensed to receive such waste, at the end of the radioactive material storage, which may not exceed one hundred years from the time of the receipt of the waste.

(N) Commencement of construction prior to the director issuing a license or renewal for the AIF is at the economic risk of the applicant.