Index	Reference	Question/Comment	Answer
1	A.3.1.1, p. 8	In the introductory paragraph, it is declared that The President's Fiscal Year (FY) 2021 Budget requests appropriations from the Nuclear Waste Fund (NWF), which would prioritize the development and implementation of an interim storage program for nuclear waste. Are you expecting any significant changes in development of nuclear waste management programs under new president´s administration?	In 2021, Congress appropriated funds to the Department of Energy (DOE) for interim storage activities. Congress has recommended that DOE move forward under existing authority to identify potential sites for Federal interim storage facilities using a consent-based siting process.
2	F.5	In light of the pandemic situation what measures have been taken to assure emergency exercises? Where these exercises postponed or other arrangements have been taken by the licensee and approved by the competent authorities?	Licensees are required to conduct a full-scale emergency preparedness exercise of both the onsite and offsite emergency response plans once every two calendar years (biennial) per Appendix E.IV.F.2 of Title 10 CFR Part 50. If a licensee is unable to conduct the onsite or offsite portions of an exercise, or both, due to the public health emergency, then it would need to submit a request to the Nuclear Regulatory Commission (NRC) for approval of a temporary exemption to either conduct the exercise(s) in the following year, or to temporarily not perform the exercise(s). In 2006, NRC issued RIS-2006-03 (The document can be found at NRC's Agency-wide Documents Access and Management System [ADAMS], under ML053390039.), which provides guidance on how to request an exemption from the biennial emergency preparedness exercise requirements. On March 27, 2020, NRC and the Federal Emergency Management Agency (FEMA) issued a joint memorandum (which can be found at NRC's ADAMS, under ML20085F705), which provides guidance to NRC and FEMA Regional staff on exercise postponement. On May 14, 2020, NRC issued a letter to industry (which can be found at NRC's ADAMS, under ML20120A003), which provides guidance for licensees to request exemptions from the biennial emergency plan exercise requirements, due to the Coronavirus-2019 pandemic, on an expedited basis. Since September 2020, NRC has issued 28 exemptions for power reactor licensees, 2 exemptions for research and test reactor licensees, and 5 exemptions for fuel cycle licensees for deferral of biennial emergency plan exercises. Additionally, NRC issued four license amendments to fuel

Index	Reference	Question/Comment	Answer
			cycle licensees for deferral of emergency plan requirements (e.g., training drill frequencies, surveillances).
3	F.4.2, p. 79	Are exposed workers/radiation workers in your country categorized based on expected effective/equivalent doses?	No, the Nuclear Regulatory Commission (NRC) regulations classify workers in nuclear facilities according to the type of NRC-licensed facility where they work, rather than on the "expected" dose or dose limits. The regulations at 10 CFR 20.2206 identify seven categories of licenses for which the reporting of annual occupational doses for workers is required. These categories are: (1) commercial nuclear power reactors and test reactor facilities; (2) industrial radiographers; (3) fuel processors (including uranium enrichment facilities), fabricators, and reprocessors; (4) facilities manufacturing and/or distributing byproduct material; (5) Independent Spent Fuel Storage Installations; (6) facilities for land disposal of low-level waste; and (7) geologic repositories for high-level waste. At this time, there are four low-level waste disposal facilities licensed in the U.S. by Agreement States. These facilities are subject to similar requirements that would be imposed if they had been licensed by NRC. NRC has not currently licensed any low-level waste disposal facilities or geologic repositories for high-level waste.
4	F.4.2, p. 79	What is the criterion for categorization or classification of workers?	As discussed in the Answer to Question 3, the Nuclear Regulatory Commission (NRC) regulations classify workers in nuclear facilities according to the type of NRC-licensed facility where they work, rather than by the "expected" dose or NRC's dose limits. Workers are categorized by certain licensee types for reporting of annual occupational doses per 10 CFR 20.2206.
5	F.4.2, p. 79	What is the dose limit for pregnant and breastfeeding female exposed workers/radiation workers?	The Nuclear Regulatory Commission (NRC) regulations at 10 CFR 20.1208, Dose equivalent to an embryo/fetus, provide the dose limit of 5.0 mSv for declared pregnant workers during the gestation period. There is no specific dose limit for breastfeeding females.
6	F.4.2, p. 79	Is there a database of exposed workers and their doses (national register of doses)?	Yes, the Nuclear Regulatory Commission (NRC) requires reporting of annual occupational doses for the seven categories of NRC's licensees identified in the Answer to Question 3. The reported information is compiled in NRC's Radiation Exposure Information and Reporting System which can be found at: http://www.reirs.com and provides additional information.
7	A.3.1.1, p. 8	What is timetable of prolonged study of deep central spend fuel repository? Could be obtained knowledge of Yucca Mountain applied on any other locality?	For the past 10 years, Congress has appropriated no funds to the Department of Energy for a permanent disposal facility at Yucca Mountain or to the Nuclear Regulatory Commission (NRC) for the Yucca Mountain licensing proceeding. NRC's adjudicatory proceeding on the Yucca Mountain license application is currently suspended. Site characterization data for Yucca Mountain are site specific. While some of the methods, processes, and scientific practices might be applied to other sites, many of them would

Index	Reference	Question/Comment	Answer
			not be applicable to other proposed sites at another location because of differences in the local geology and environmental features.
8	A.3.7.3, p. 17	If we understand this correctly, it is not necessary to transfer land in the case of model No 3 (the temporary license transfer to a decommissioning company), as in the case of model No 4 (the permanent license transfer)? Does this mean that the associated land is not part of the transfer for decommissioning purposes? In the case of model No 4, is the transfer of ownership of the land permanent?	In the temporary license transfer model, the licensee that operated the reactor retains ownership of the land. However, in those cases, the decommissioning company is responsible for such things as decontaminating the land and controlling access to the land until the license is transferred back to the licensee that operated the reactor. In the case of permanent license transfer, the ownership of the land and other assets are transferred to the decommissioning company, which completes decommissioning and ultimately requests license termination. Additional information on the Nuclear Regulatory Commission's requirements for license transfers and mergers can be found at: https://www.nrc.gov/reactors/operating/licensing/license-transfers-mergers.html.
9	F.6.1, p. 96	Could you explain to us the main differences between routine decommissioning sites and non-routine decommissioning sites?	In this context, the words "non-routine" and "complex" refer to materials sites in which the complexity of the decommissioning process will require more than minimal technical and administrative support. Decommissioning of materials licenses, such as academic, medical, and industrial licenses, usually require minimal technical and administrative support and are routine. As described in the Nuclear Regulatory Commission's (NRC's) Status of the Decommissioning Program 2020 Annual Report, it is expected that complex materials sites will require more than a year to complete the decommissioning process. Examples of complex materials sites include sites with groundwater contamination, sites containing significant soil contamination, sites in which the owners are in bankruptcy, any site where a decommissioning plan is required, all fuel cycle facilities undergoing decommissioning, and sites where either the public or a government body has expressed significant interest. The Status of the Decommissioning Program 2020 Annual Report is available at NRC's Agency-wide Documents Access and Management System, under ML20259A507.
10	D.2.1, p. 40	What types of methods for treatment of radioactive liquid concentrates are currently used?	Treatment of waste concentrates depends on the specific waste stream. Waste from nuclear power plant water conditioning is very different from the Department of Energy (DOE) legacy waste in tanks, that is managed as high-level waste. Depending on the waste stream, treatment of the latter has involved large chemical processing facilities. For example, at DOE's Savannah River Site, the Salt Waste Processing Facility for tank waste separates and concentrates cesium, strontium, actinides, and waste slurry from

Index	Reference	Question/Comment	Answer
			the less radioactive salt solution. The concentrated solution is sent to the Defense Waste Processing Facility, a vitrification facility, where it is turned into glass and poured into canisters for eventual disposal.
11	D.2.1, p. 40	One of measures for minimization of RAW in the *[Contracting Party]* is to improve the system for RAW treatment at NPP *[facility name]*, which will allow significant volume reduction of liquid RAW produced so far. Treatment of radioactive liquid concentrates by [*company name*] achieves separation of dissolved salts from radioactive nuclides, their crystallization and then released into the environment as hazardous waste (not as RAW). This technology was installed as a prototype facility at the WWER type of reactor in *[facility name]*. Such technology is according to [*company name*] so far used only at PWR and BWR types of reactors in the U.S. and also abroad. Is used this or a similar technology for treatment liquid radioactive concentrates today? If yes, what is your operational experience feedback?	[*company name*] is a U.S. company providing expertise in water treatment services to a variety of clients worldwide. The U.S. government does not have feedback from applications at nuclear power plant licensees as requested, but that might be available from the vendor. Notwithstanding, [*company name*] has developed technology that was recently deployed to begin early treatment of tank waste at the Department of Energy (DOE) Hanford Site in the State of Washington. The Tank Side Cesium Removal (TSCR) system will remove radioactive cesium, other radionuclides, and undissolved solids from low activity tank waste as part of the Direct-Feed Low-Activity Waste Program, which is an approach that sends certain low-activity waste from the tank farms to the Waste Treatment and Immobilization Plant's Low-Activity Waste Vitrification Facility for vitrification. TSCR is based on the SARRY System deployed at Fukushima Daiichi Nuclear Power Plant in Ōkuma, Fukushima, Japan, following the plant's disaster caused by the 2011 Tōhoku earthquake and tsunami. A system like Hanford TSCR is the Tank Closure Cesium Removal (TCCR) currently in use at the DOE's Savannah River Site in South Carolina. TCCR is a mobile system that can be positioned at or near a specific tank to selectively remove the cesium component of the tank waste via ion exchange. TCCR began operations in January 2019. TCCR was designed, built, tested, and delivered by Westinghouse Electric Company and Columbia Energy and Environment Services.
12	K.2.3, p. 149	Was grout strengthening applied only on a damaged section or on the whole tunnel at Hanford site? How long this will postpone the radioactive material store final solution?	Both Tunnel 1 and Tunnel 2 of the Plutonium Uranium Extraction Facility (PUREX) at the Hanford Site were filled with grout material to assure their structural integrity. Meanwhile, a permanent solution will be developed to remediate both tunnels, as well as disposition the stored equipment and waste.

Index	Reference	Question/Comment	Answer
13	G.6, p. 111	In regard to NUREG/CR-6831 study, Examination of Spent PWR Fuel Rods after 15 Years in Dry Storage, are there any similar long-term studies ongoing, or planned?	Yes. The Idaho cask demonstration presented in NUREG-CR/6831, Examination of Spent PWR Fuel Rods After 15 Years in Dry Storage, (which is available at Nuclear Regulatory Commission's (NRC's) Agency-wide Documents Access and Management System, under ML032731021) and other research, including NUREG/CR-6745, Dry Cask Storage Characterization Project—Phase 1; CASTOR V/21 Cask Opening and Examination, (Bare et al., 2001), demonstrated that low burnup fuel (assembly average burnup less than 45 gigawatts per metric ton of uranium [GWD/MTU]) cladding and other cask internals had no deleterious effects after 15 years of storage. These research results suggest that degradation of low burnup fuel cladding and assembly hardware should not occur during long-term storage, provided that the cask or canister internal environment is maintained. The U.S. is undertaking a similar demonstration program to provide confirmatory data on high burnup fuel (assembly average burnup exceeding 45 GWD/MTU) that can be used to assess cladding performance during long-term storage. This program is the "HBU Dry Storage Cask Research and Development Project" (HDRP), which is being conducted by the Electric Power Research Institute and the U.S. Department of Energy (see HBU Dry Storage Cask Research and Development Project, Final Test Plan at https://www.osti.gov/servlets/purl/1133392). The HDRP began in 2017 with the loading of several types of high burnup fuel cladding in a dry storage cask. At that time, data was collected on the temperatures and gas composition of the internal cask environment. In parallel, the HDRP has been performing laboratory testing and examinations on high burnup fuel cladding ("sister" rods, similar to those stored in the demonstration cask) to provide additional information to understand cladding performance after cask drying operations. Short-term testing (i.e., laboratory-scale testing up to a few months) and scientific analyses examining the performance of high burnup fuel have been relied on to develop the technical basis that long-term storage of high burnup fuel may be performed safely and in compliance with regulations. However, given the reliance on relatively short-term testing to predict long-term cladding behavior, the HDRP is expected to provide confirmatory data to provide additional assurance of safe fuel storage for extended storage terms.
14	p. 72	Besides technical qualifications and personnel training programs	The U.S. Sixth National Report (which can be found at: https://www.energy.gov/sites/default/files/2017/12/f46/10-20-

Index	Reference	Question/Comment	Answer
		for employees; what are the methods used to assure knowledge transmission from one generation to the other?	17%206th_%20US_National_Report%20%28Final%29.pdf) provides a detailed discussion in Section F.2., "Human and Financial Resources," of the Federal Government's efforts to capture institutional knowledge. The National Report indicated that "[t]o address growing concerns about the potential loss of a significant portion of the Federal Government staff and their institutional knowledge, it is increasingly incumbent upon agencies to institute practices and programs to encourage effective succession planning and knowledge management. Knowledge management remains a top priority to ensure Federal agencies capture and preserve knowledge to assist with employee development and performance. Many agencies use continuously evolving knowledge management tools such as creating communities of practice to enable employees who perform the same job function to share relevant knowledge and critical skills, capture operating experience, and discuss new information. The communities of practice often collaborate to consider safety and security issues, review knowledge gained from inspection, research, and other activities related to regulatory guidance. The method has helped document relevant critical knowledge from employees departing the agencies and from former employees where possible." The U.S. Government uses the website Regulations.gov for maintaining and sharing information about its activities. The website helps remove the logistical barriers that made it difficult for a citizen to participate in the regulatory process. Through this website, the public can participate and impact Federal rules and regulations. The complete administrative record related to the decision-making process can also be accessed by all including the Federal agencies and the public for knowledge management. The Nuclear Regulatory Commission's (NRC's) current tools also include a Wikipedia-like site called "Nuclepedia," which is NRC's internal knowledge resource created to capture and share information across organizations and to serve as a repository of knowledge that all employees can access, contribute to, and learn from. NRC also maintains a Knowledge Management video library and a NUREG/Knowledge Management Series (a series of publications established to preserve knowledge of documents and events that shaped the regulatory process or a technical topic that benefits future generations of NRC professionals and the public).

Index	Reference	Question/Comment	Answer
			The Department of Energy (DOE) is dedicated to recruiting, engaging, developing, retaining, and advancing a diverse workforce of talent. DOE provides employees and supervisors with a wide range of resources, including talent sourcing, professional development, leadership training, and educational opportunities to cultivate individual and organizational excellence. Mandatory training is implemented for all DOE Federal employees and selected groups of contractor employees who are required to complete initial and recurring training courses, as required by law, directive, DOE Order, etc. The training covers diverse Federal requirements: ethics; employee conduct; human resource guidance; safety; physical, personnel, and information security; and continuity of operations. Heads of Departmental Elements may impose additional requirements to meet specific program or functional needs, and some mandatory training is position-specific (e.g., supervisors, hiring authorities, Senior Executive Services). This mandatory training is essential to our workforce and enhances our work toward the overall DOE mission. DOE provides access to a collaborative platform – through a central, web-based collection point for corporate operating experience lessons learned and best practices from across the DOE complex. Subscribers could prevent adverse events and improve processes and performance by using the database which can be found at: https://ww.energy.gov/ehss/lessons-learned-database. DOE Occurrence Reporting Program provides a system for collecting information about events that could adversely affect the public or DOE worker health and safety, the environment, national security, DOE's safeguards and security interests, functioning of DOE facilities, or the DOE's reputation. DOE analyzes aggregate occurrence information for generic implications and operational improvements. The Occurrence Reporting Program can be accessed by DOE employees. DOE also uses the following tools: Lunch and learns- voluntary meetings, training sessions, or presentations that take place during lunch to allow employees to teach other what they are best at, giving them an opportunity to nurture their skills.

Index	Reference	Question/Comment	Answer
			Employee Development/Mentoring Programs- programs tailored to improve our employees' existing skills and competencies, while developing newer ones to support the organization's mission and goals. Community of Practice- focuses on analyzing and improving processes every day and using teams who work in the process, to make these improvements as a part of their daily activities. Over time, we have seen these small changes add up to huge improvements and more developmental opportunities.
15	p. 71	How is the development of the market situation assessed with regard to whether there will continue to be enough interested and qualified personnel on the market in the next 10-20 years, who can be recruited for work in spent fuel and radioactive waste management activities?	As noted in Section F.2 of the U.S. Seventh National Report, "The U.S. understands the need to retain institutional knowledge and operational experience in fields impacting spent fuel and radioactive waste management…The U.S. Sixth National Report at Section F.2 discusses in detail the issues of staffing, staff development, reliability of funding, and other human resource areas, as this was a theme for all Contracting Parties to address during the Sixth Cycle of the Joint Convention." Additionally, Federal agencies also have access to the Presidential Management Fellows Program which is designed to attract qualified candidates to Federal Government service. The Department of Energy (DOE) Office of Environmental Management (EM) and its contractors are working to continue building and sustaining a best-in-class workforce utilizing a diverse assortment of recruitment and hiring flexibilities. These flexibilities include use of a suite of summer intern programs by recruiting diverse students with science, technology, engineering, and mathematics (STEM) areas of study to work on EM projects and leveraging these diverse students for available internship opportunities through programs such as the DOE Scholars Program, the Minority Serving Institutions Partnership Program, the DOE Florida International University Fellows Program, and Federal Pathways Programs. EM also supports veterans and disability programs, through the Federal veterans' hiring preferences and contractors' participation in the Operation Warfighter Program/Workforce Recruitment Program, which is designed to provide recuperating service members with meaningful activity outside of the hospital environment. Lastly, EM is working to engage early career professionals through a variety of means, such as Federal opportunities through the Pathways programs. EM contractors use regional partnerships to ensure a consistent workforce pipeline. Some specific examples of EM's efforts are outlined below:

Index	Reference	Question/Comment	Answer
			- At Los Alamos, legacy cleanup contractor Newport News Nuclear BWXT Los Alamos, LLC (N3B) works with Northern New Mexico institutions to run a Nuclear Operators Apprenticeship Program, a Radiological Control Technician Boot Camp, and a Waste Processing Operator Boot Camp. - Pacific Northwest National Laboratory works closely with area colleges like Washington State University to facilitate research internships, including addressing related cleanup challenges at the Hanford site. - Oak Ridge cleanup contractor URS-CH2M Oak Ridge, LLC (UCOR) invests in local schools for K-12 STEM activities and partners with institutions to form new curricula with nuclear engineering, nuclear decommissioning, and environmental management, and seeks out students in the STEM disciplines for internship opportunities through programs such as the DOE Scholars Program, the Minority Serving Institutions Partnership Program, and the DOE Florida International University Fellows Program. - DOE also supports grants for the Workforce Opportunities in Regional Careers program and partners with many other universities through the Consortium for Risk Evaluation with Stakeholder Participation, which funds approximately 20 early career researchers (i.e., PhD students, postdocs, undergraduate students).
16	A,7	US national Report mentions that the Disused Sealed Sources waste is managed through reuse, recycling, disposal, and storage. How and what is the recycling technology or the recycling of sealed source in the US?	Recycling is performed by commercial companies under the terms of Nuclear Regulatory Commission or Agreement State license. In general, these companies have flexibility to identify the recycling technologies that are best suited for a particular application, so long as they adhere to the safety and security requirements in their license. For example, if the licensee performing recycling plans to remove the source material from its encapsulation, this must be permitted per the terms of their license. The following methods for recycling sealed sources are typically used in the U.S.: - A source is reused intact without modifications to the source or contents – also known as “re-use.” - A source originally used for one application (e.g., well logging) is used for a different application (e.g., calibration source) without modification – also known as “re-purposing.”

Index	Reference	Question/Comment	Answer
			- A source material is extracted and/or the source is re-encapsulated, and a new source(s) is created with a new serial number. - The source material is extracted and then used as unsealed material – not as a sealed source.
17	A,12	The US national report mentions Depleted Uranium management. How does The US manage the disused Depleted Uranium originating from the shielding of the gamma/radiography camera?	The National Nuclear Security Administration Off-Site Source Recovery Program does not recover or manage disused radioactive sources from radiography cameras. These sources are typically sent back to the manufacturer to be reloaded and the disused material is then managed by the manufacturer per the terms of their license. The radioactive sources used in radiography cameras (i.e., lawrencium-192, selenium-75, and cobalt-60) can be commercially disposed of in the U.S. and the depleted uranium can be managed, recycled, or disposed of by commercial brokers at licensed LLW disposal facilities. The Nuclear Regulatory Commission is also proposing to amend its regulations in 10 CFR Part 61 that govern low-level waste (LLW) land disposal facilities to require new and revised site-specific technical analyses and to permit the development of site-specific criteria for LLW acceptance based on the results of these analyses. The proposed changes would ensure that future LLW streams that differ significantly from those considered during the development of the original regulations, e.g., depleted uranium, can be disposed of safely and meet the performance objectives for land disposal of LLW during the compliance period. See Section K.1.2.1. in the U.S. Seventh National Report.
18	A,14	The US national report mentions the extending of repatriation program for US-origin spent fuel. Does this also cover the spent fuel from *[Contracting Party]*? if so, what is the procedure for us to propose this scheme? The US national report mentions the waste from the Mo99 production by the fission process. How does the US manage the irradiated capsule waste and RFW from the Mo99 production activities?	The original Foreign Research Reactor Spent Nuclear Fuel Acceptance Program (Acceptance Program) ended on May 12, 2019. The National Nuclear Security Administration (NNSA) performed a Supplemental Analysis (EIS-0218-SA-08, April 2019, which can be found at: https://www.energy.gov/nepa/articles/eis-0218-sa-08-supplement-analysis-april-2019) under the National Environmental Policy Act to extend the Acceptance Program through May 12, 2029. However, permission to continue to return Acceptance Program material is being severely restricted and exemptions to the May 12, 2019, end date will only be granted where there is clear justification to do so, in accordance with the Policy on Exemptions to the Acceptance Program ("Policy on Exemptions") signed by the NNSA Administrator on December 22, 2016. The spent fuel containing U.S.-origin low enriched uranium in *[Contracting Party]* would not meet the requirements of the Policy on Exemptions.

Index	Reference	Question/Comment	Answer
			The American Medical Isotopes Production Act of 2012 (AMIPA) authorized the Department of Energy (DOE) to establish a program to evaluate and support projects in the U.S. for the production of molybdenum-99 for medical purposes without the use of highly enriched uranium. Per AMIPA, in 2016, DOE established a Uranium Lease and Take-Back Program (ULTB). Under the ULTB Program, DOE makes low-enriched uranium (LEU) available to commercial entities through lease contracts for production of molybdenum-99. After irradiation, processing, or purification of the leased uranium, DOE retains responsibility for the final disposition of the spent fuel and takes title to and be responsible for the final disposition of radioactive waste. Both the LEU lease and take-back contracts include cost recovery provisions in which the Federal government will be reimbursed for the cost of leasing the LEU and the "taking back" of the spent fuel. The molybdenum-99 producer will be responsible for characterizing, packaging, and transporting spent fuel and radioactive waste returned to DOE under the ULTB. For more information visit: NNSA's Molybdenum-99 Program: Establishing a Reliable Domestic Supply of Molybdenum-99 Produced Without Highly Enriched Uranium at: https://www.energy.gov/nnsa/nnsas-molybdenum-99-program-establishing-reliable-domestic-supply-mo-99-produced-without#:~:text=button%20button-,NNSA's%20Molybdenum%2D99%20Program%3A%20Establishing%20a%20Reliable%20Domestic%20Supply%20of,Produced%20Without%20Highly%20Enriched%20Uranium&text=NNSA%20works%20to%20prevent%20the,usable%20nuclear%20or%20radiological%20material.
19	F,96	Decommissioning program comprehensively uses the dose approach to regulate the decommissioning activities. What is the dose limit used as the approach for this decommissioning program? Is it the same as the dose limit for radiation worker for normal condition in the US (50 mSv/year)?	The Nuclear Regulatory Commission's (NRC's) dose limits for adults, stated in 10 CFR Part 20, Subpart C establish occupational dose limits that apply during operations and decommissioning. NRC regulations for license termination for unrestricted use located in 10 CFR Part 20, Subpart E establish an NRC dose limit of 25 mrem (0.25 mSv) per year total effective dose equivalent above background, which includes residual radioactivity from groundwater sources of drinking water. In addition, NRC regulations require residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA).
20	F,105	NRC conducts 900 inspections per year to the licensee of nuclear	The Nuclear Regulatory Commission (NRC) normally conducts on-site inspections of its nuclear material licensees. It is noted however that during the COVID-19 public health

Index	Reference	Question/Comment	Answer
		facilities. Is it full on-site inspection or combined with online inspection (document upload, video streaming, or others)?	emergency, NRC maximized the use of remote inspection techniques due to the restrictions on travel and to limit close contact. NRC continues to leverage the remote inspection techniques where it is deemed appropriate and is currently augmenting its on-site presence in the conduct of inspections.
21	Section F.7.2 Page 98	With regard to waste minimization, has the USA considered smelting of decommissioning metal and then clearance and recycling? Especially for metal waste from decommissioning.	The Department of Energy's facilities continue to operate under the suspension of clearance and recycling of decommissioning metal waste and have taken on the burden of accumulating valuable clean scrap metals that are in some cases stored in radiological areas. Under the current policy, release of the metals would require permission from the Secretary of Energy. Detailed guidance can be found at: https://www.energy.gov/ehss/articles/moratorium-and-suspension-release-metals-doe-sites.
22	Section F.4.21. Page 80	""...the limit is 0.05 sievert (Sv)/yr." Is the NRC limit for occupational exposure 50mSv/y and not 20 mSv/y? F.4.3.2 DOE says 20 mSv/y. Are there different limits?"	The Department of Energy (DOE) has occupational dose limits and administrative control levels (ACLs) that are based on dose methodologies from the International Commission on Radiological Protection (ICRP) Publication 60 recommendations. At DOE, the occupational dose limit is 5 rem/year (50 mSv/year) total effective dose, provided in DOE regulations in 10 CFR Part 835. Additionally, the ACL is 2 rem/year (20 mSv/year), which requires prior approval to exceed. DOE ACLs are based on historical background, projected radiation exposures, workload, mission, and as low as reasonably achievable requirements. The Nuclear Regulatory Commission (NRC) regulations are based on ICRP Publication 26 recommendations and the occupational dose limits for adults are provided in NRC regulations at 10 CFR 20.1201, which include, among other limits, an annual total effective dose equivalent limit of 5 rem (50 mSv).
23	F4.2, p. 79	What is in 10 CFR Part 20.1003 the difference between "controlled area" and "restricted areas" as well as "radiation area" and "high radiation areas" resp. "airborne radioactivity area"? Alternative question: Which category (controlled or restricted area) a "radiation area" (external dose rate > 0.05 mSv/h) or an "airborne radioactivity area" (activity in air >	The controlled area refers to the entire area inside the site boundary of a Nuclear Regulatory Commission (NRC) licensed facility to which access can be limited by the licensee for any reason. The restricted area of a facility refers to the area inside the controlled area to which access is limited by the licensee for the purpose of protecting individuals (facility workers) from undue risks of exposure to radiation and radioactive materials. Restricted area does not generally include areas used as residential quarters, but separate rooms in a residential building may be set apart as a restricted area. Radiation area and high radiation area are differentiated by radiation level. A radiation area is an area within a facility that is accessible to individuals and where radiation levels could result in an individual receiving a dose equivalent in excess of 0.005 rem (0.05 mSv) in 1 hour at 30 centimeters from the radiation source or from any surface that the

Index	Reference	Question/Comment	Answer
		DAC, DAC x 2000h = ALI = 50 mSv) has to be appointed to?	radiation penetrates. A high radiation area is an area that is accessible to individuals and where radiation levels from radiation sources external to the body could result in an individual receiving a dose equivalent in excess of 0.1 rem (1 mSv) in 1 hour at 30 centimeters from the radiation source or 30 centimeters (11.8 inches) from any surface that the radiation penetrates. Both radiation areas and high radiation areas are located within the restricted area of a facility.
24	F.5.3, p. 95	Regarding the training for first responders conducted by EPA: Please elaborate on trainings foreseen for persons with special responsibilities in an emergency who are not part of the designated response organisation, e.g. additional bus drivers for evacuation.	The training conducted by the Environmental Protection Agency (EPA) is primarily for those who have designated roles within the responding organization, e.g., for dose assessment or advisories on protective actions for public health or food safety. Training for other support personnel such as bus drivers would be conducted by the local authorities with immediate responsibility for public safety.
25	Section E	How does US ensure the long term political commitment on national level for the high level waste and spent nuclear fuel disposal project?	The national policy for disposing of spent fuel and high-level waste is established by the Nuclear Waste Policy Act of 1982, as amended. Annually, each Presidential Administration submits a budget request to Congress that includes the funding it deems necessary to comply with the Act. Congress evaluates the request and determines the amount of funding to appropriate considering a wide range of factors, including testimony by members of the Executive branch in support of the President's budget request.
26	F.2.3.2., pg 73	As the statutory fee has been suspended since 2014, and the licensees update their own decommissioning funding plans, how can they exactly assure the financial security to cover the costs of all the future disposal activities?	Disposal remains a Federal government responsibility. The fee required by the Nuclear Waste Policy Act (NWPA) is intended to cover the costs incurred by the Federal government associated with disposal of commercial spent fuel and high-level waste. The ongoing fee was set to zero in 2014 based upon a court decision. However, the court decision provided that the Department of Energy (DOE) could resume collecting the fee in the future if it pursued a disposal plan that was authorized by Congress. The current balance of the Nuclear Waste Fund (NWF), which includes past fees collected and accrued interest, exceeds $43 billion. If DOE were to determine in the future that the NWF had insufficient revenues to recover costs incurred by the Federal government for its disposal activities under the NWPA, then DOE would have to evaluate and propose an appropriate adjustment to the fee to ensure full cost recovery.

Index	Reference	Question/Comment	Answer
27	G.6., pg 113	How is the experience gained from events under INES 2 implemented nationally?	Level 2 or higher events on the International Nuclear Event Scale (INES) pertaining to spent fuel management did not occur in the U.S. during the period 2017–2019. Additionally, the Nuclear Regulatory Commission (NRC) is not aware of significant events associated with spent fuel storage that were reported internationally that would be applicable to the storage facilities in the U. S. NRC performs operating experience assessments on reported events. Reported events are included in the Office of Nuclear Material Safety and Safeguards trending studies and can receive increased visibility through inclusion in the Agency Action Review Meeting (AARM). One of the criteria for identifying nuclear materials licensees for discussion at the AARM is, in part, a Level 3 or higher INES Report to the International Atomic Energy Agency. Since the events reported for spent fuel storage have not met the threshold, discussion in this meeting is not expected. The latest annual report to the Commission on licensee performance in the nuclear materials and waste safety program is for Fiscal Year 2020 (see SECY-21-0047, which can be found at NRC's Agency-wide Documents Access and Management System, under ML21075A101).
28	E.2.1.4, p. 57	According to 10 CFR 50.82, power reactor licensees are required to complete decommissioning within 60 years, which means that two generations will be involved in the project: How do you assure knowledge management and knowledge transfer over this timespan? Is the 60-year-criteria applicable for all kind of nuclear facilities (also for FCF and RR)?	The 60-year criterion only applies to power reactor licensees. If a power reactor licensee chooses to delay decommissioning activities, knowledge management during the 60-year period is assured by both substantial recordkeeping requirements that apply to individual licensees and, more broadly, the U.S. experience with decommissioning of over thirty light water reactors. This experience is documented in numerous industry and government technical reports on past decommissioning activities. For example, the Electric Power Research Institute has published a lessons learned report, which can be found at: https://www.epri.com/research/products/1013510. For power reactors undergoing decommissioning, routine oversight under Inspection Manual Chapter 2561 (which can be found at the Nuclear Regulatory Commission's Agency-wide Documents Access and Management System, under ML17348A400) also includes an assessment of organizational changes to ensure adequacy throughout the decommissioning process. In the U.S., companies specializing in decommissioning also maintain the technical and engineering expertise to perform the decommissioning.
29	E.2.1.4, p. 57	When a facility is about to be permanently shut down before the expiration of its license: has the regulatory body to be informed in advance?	The regulations in 10 CFR 50.82 state that when a power reactor licensee has made its determination to permanently cease operations, the licensee shall, within 30 days, submit a written certification to the Nuclear Regulatory Commission (NRC). In practice, licensees often inform NRC before the reactor permanently ceases operation, though this is not required.

Index	Reference	Question/Comment	Answer
30	E.2.1.4, p 57	Has the final decommissioning plan to be approved prior to the start of dismantling activities?	For power reactors, a licensee may begin major decommissioning activities without specific Nuclear Regulatory Commission (NRC) approval 90 days after NRC receives the licensee's post-shutdown decommissioning activities report. Then, at least two years before the planned termination of the license, the licensee must submit an application for termination of the license and a license termination plan. In the Federal Register, NRC announces receipt of the license termination plan, makes the plan available for public comment, and holds a public meeting on the plan in the vicinity of the facility. If the plan demonstrates that the remainder of decommissioning activities will be performed in accordance with NRC regulations, then NRC approves the plan. For other facilities that process byproduct, source, and special nuclear material regulated under 10 CFR Parts 30, 40, and 70, if a decommissioning plan is required, the licensee may not begin decommissioning until approval of that plan.
31	E.2.1.4, p. 57	Is it possible to conduct certain decommissioning activities prior to the approval of the final decommissioning plan?	With respect to power reactors, yes, because, as discussed in response to Question 30, a licensee may begin major decommissioning activities 90 days after the Nuclear Regulatory Commission (NRC) receives the licensee's post-shutdown decommissioning activities report (PSDAR). Regulations do not require NRC approval of the PSDAR to initiate decommissioning; only that the licensee request NRC approval for the license termination plan at least two years before planned termination of the license. With respect to facilities that require an approved decommissioning plan before decommissioning may begin, no, but the licensee may continue previously approved licensed activities not related to decommissioning, such as equipment maintenance, maintenance of access controls, and environmental monitoring and surveillance.
32	F.2.3.4, F.2.3.5, p. 74-76	The NRC estimates costs for decommissioning a nuclear power plant range from $280-$612 million. Are the estimated costs compared to the actual costs during and after decommissioning? If yes, how accurate were the estimates?	As background, the Nuclear Regulatory Commission (NRC) requires that power reactor applicants and licensees provide adequate assurance that funding will be available for decommissioning with an application under 10 CFR 50.75 and 10 CFR 50.33(k). Applicants are to provide financial assurance of the availability of funding based, initially, on a minimum formula amount for radiological decommissioning that currently (2020 dollars) ranges from about $445 million for the nation's smallest pressurized water reactors to close to $700 million for the nation's largest boiling water reactors. These amounts do not represent the actual cost to decommission specific reactors but are reference levels established to ensure: (1) that licensees demonstrate adequate financial responsibility for decommissioning; and (2) that the bulk of the funds necessary for safe decommissioning is provided for early in the licensing process. When a power plant approaches the end of its operating life, the licensee: (1) must provide a site-specific cost estimate (SSCE) to provide a more accurate estimate of the expected decommissioning

Index	Reference	Question/Comment	Answer
			costs, and (2) must ensure that adequate funding is set aside to address the SSCE. Licensees are required to annually update their SSCEs and to report to NRC that there is sufficient funding to cover the SSCEs. Therefore, the SSCEs are continually compared to the actual costs during decommissioning to ensure that there are sufficient funds to complete decommissioning. NRC does not compare the ultimate actual cost of decommissioning with the minimum formula amount applicable at the outset of power reactor operations.
33	F.6, p. 96	Is there a requirement for immediate decommissioning as a strategy? Do you have a preferred decommissioning strategy (immediate, deferred, entombement)?	For power and non-power reactors, there is no requirement for a licensee to pursue immediate decommissioning. The Nuclear Regulatory Commission (NRC) does not have a preferred decommissioning strategy. For other facilities that process byproduct, source, and special nuclear material regulated under 10 CFR Parts 30, 40, and 70, unless otherwise approved by NRC, licensees are required to complete decommissioning of their facilities within 24 months of initiating decommissioning activities. More information on NRC's decommissioning timeliness rule can be found in RIS 2015-19, Revision 1, at NRC's Agency-wide Documents Access and Management System, under ML16008A242.
34	F.6, p. 96-97	Is there an agreement/memorandum of understanding that regulates the responsibilities between NRC and DOE? Who decides/mediates in the case of doubt?	There are no agreements or memoranda of understanding between the Department of Energy (DOE) and Nuclear Regulatory Commission (NRC) on decommissioning of DOE-owned facilities. In general, DOE manages the decommissioning of its facilities that are not licensed by NRC. For those facilities for which DOE holds an NRC license (e.g., spent fuel storage facilities), DOE will be required to decommission the facilities in accordance with NRC requirements.
35	Section A.2.2, p. 6	The question refers to the paragraph: "However, the continuing uncertainty in the repository program and the recent premature retirements of several nuclear power plants (NPPs) require that current attention is focused on ensuring safety in storage." It is comprehensible that the attention is focused on ensuring safety in storage as long as the	For the past 10 years, Congress has appropriated no funds to the Department of Energy (DOE) for a permanent disposal facility at Yucca Mountain or to the Nuclear Regulatory Commission (NRC) for the Yucca Mountain licensing proceeding. NRC's adjudicatory proceeding on the Yucca Mountain license application is currently suspended. DOE continues to work on a disposal research and development program as part of developing a path forward for a comprehensive waste management system. In addition, it is anticipated that the consent-based siting approach being developed to site Federal interim storage facilities could be adapted to site one or more repositories at such time that DOE receives authorization and funding from Congress to pursue development of repositories.

Index	Reference	Question/Comment	Answer
		geological repository is not defined. However, best praxis according to current knowledge is the disposal of radioactive waste in a geological repository as soon as possible. How does the USA tend to reduce the uncertainties in the repository program?	
36	A.3.1.1 p. 8, K2.1 p. 146, D1.2. p.38	"Coupled with the funding for spent fuel to support R&D and analysis of storage, transportation, and disposal technologies and pathways, the President's request supports the development of a durable, predictable yet flexible plan that addresses more efficiently storing waste temporarily in the near term, followed by permanent disposal." "For example, DOE will support planning for the near-term consolidation and storage of commercial spent fuel until a long-term solution is determined." "The U.S. currently has no facility for spent fuel disposal. In 2008, DOE applied to NRC for authorization to construct a geologic repository at Yucca Mountain, Nevada, for spent fuel and HLW disposal. The	For the past 10 years, Congress has appropriated no funds to the Department of Energy (DOE) for a permanent disposal facility at Yucca Mountain or to the Nuclear Regulatory Commission (NRC) for the Yucca Mountain licensing proceeding. NRC's adjudicatory proceeding on the Yucca Mountain license application is currently suspended. DOE continues to work on a disposal research and development program as part of determining a path forward for a comprehensive waste management system. In addition, it is anticipated that the consent-based siting approach being developed to site Federal interim storage facilities could be adapted to site one or more repositories at such time that DOE receives authorization and funding from Congress to pursue development of repositories.

Index	Reference	Question/Comment	Answer
		adjudication on the application is suspended." What are the plans for the permanent disposal?	
37	A.3.1.4 p. 10	"DOE may determine that waste is not 'highly radioactive' and is therefore not HLW if the waste: - Does not exceed concentration limits for Class C LLW as set out in 10 CFR 61.55, and meets the performance objectives of a disposal facility; or - Does not require disposal in a deep geologic repository and meets the performance objectives of a disposal facility as demonstrated through a performance assessment (PA) conducted in accordance with applicable requirements." Concerning the second bullet point: What is the deep geological repository concept used as basis for the performance assessment? What are the above-mentioned performance objectives? This information could not be found in the referenced document: https://www.energy.gov/em/program-scope/high-level-radioactive-waste-hlw-interpretation	The performance assessment referred to in the second criterion would be done on the actual alternative disposal facility proposed to receive the reprocessing waste under the high-level-waste interpretation. For example, if the proposed disposal facility is a land disposal facility, performance objectives could include the Nuclear Regulatory Commission's performance objectives for commercial low-level waste (LLW) disposal facilities specified in 10 CFR Part 61, Subpart C, Performance Objectives, or the Department of Energy's (DOE's) performance objectives and dose limits for DOE LLW disposal facilities specified in DOE Manual 435.1-1, Radioactive Waste Management Manual, as summarized in https://www.energy.gov/sites/default/files/2019/06/f63/06-Performance-Objectives-CLEAN-06-07-2019.pdf.

Index	Reference	Question/Comment	Answer
38	A.3.7.2 p. 16, E.2.3.3 p. 65.	"To avoid overlapping regulatory oversight at these sites, in 2016 NRC entered into a Memorandum of Understanding (MOU) with DoD under which NRC will monitor the status of cleanup of these sites to ensure that these cleanup efforts also meet NRC's site release dose requirements." "In 1988, Congress established the DNFSB as an independent Federal organization within the executive branch of the U.S. Government. It is responsible for providing recommendations and advice to the President and the Secretary of Energy, regarding public health and safety issues at DOE defense nuclear facilities." In addition to the Memorandum of Understanding are there additional plans to unify the regulations in order to avoid overlapping of regulatory activities or a lack of regulatory oversight?	The Nuclear Regulatory Commission (NRC) believes the Memorandum of Understanding is an adequate vehicle to avoid overlapping regulatory oversight and currently there are no plans to unify the regulations. All Federal regulatory changes (i.e., rulemakings) involve a public process. Comments are commonly received from the public, industry, and Federal, State, local, and Tribal government agencies. In order to avoid lack of oversight or the potential overlap of regulations among governmental agencies, agencies are encouraged to comment on how the proposed regulatory changes will affect their requirements. NRC will consider any comments related to lack of oversight or overlapping activities before any regulatory changes are made. NRC periodically conducts a Retrospective Review of Administrative Requirements to identify outdated or duplicative administrative requirements that may be eliminated or modified. Suggestions are collected from NRC staff, industry, and members of the public and evaluated based on a set of five Commission-approved criteria. Suggested changes that meet the criteria and are approved by the Commission are then addressed through NRC's rulemaking process. More information can be found at: https://www.nrc.gov/about-nrc/regulatory/rulemaking/retrospective-review-admin-reqmnts.html. NRC also strives to ensure efficiency and effectiveness in rulemaking activities through consideration of the Cumulative Effects of Regulation (CER). CER describes the challenges that licensees may face when implementing a significant number of new and complex regulatory requirements stemming from multiple regulatory actions, with limited time and available resources. CER can potentially distract licensees from executing other duties that ensure safety or security. NRC's rulemaking process encourages explicit consideration of CER through interactions with stakeholders in order to resolve issues that can lead to implementation challenges; and by soliciting feedback on CER concerns to enable NRC to make better-informed decisions on how to mitigate CER.
39	K1.6 p.144, K2.2. p.148	"Acceptable Knowledge is the documentation of all known information on how a TRU waste stream was created and managed;	Detailed information of transuranic (TRU) waste is located in the publicly accessible database created in agreement with the state regulator: Waste Data System (WDS)/WIPP Waste Information System (WWIS)

Index	Reference	Question/Comment	Answer
		that information is then compiled and documented." "DOE continues to monitor and track the TRU waste volume emplaced at the WIPP facility to ensure compliance with the WIPP LWA and takes appropriate action to ensure the needs of the DOE complex as related to TRU waste disposition are decided upon in a timely and appropriate manner." In which form (database, files, documents, etc.) is this information concerning defense related TRU waste provided to the regulator? Is NRC responsible for the review of this waste? What is the procedure of defining the WAC? In which form are the WAC provided to the regulator and are they publicly available?	which can be found at: https://wipp.energy.gov/WDSPA/Home. The National TRU Program (NTP) was established by the Department of Energy (DOE) Office of Environmental Management to oversee the process of preparing TRU waste from DOE waste generator sites to meet Waste Isolation Pilot Plant (WIPP) requirements and provides guidance and requirements for receiving the waste at WIPP. This process involves the characterization and packaging of the waste at the generator sites, followed by the transportation of the waste to the WIPP facility. However, DOE committed to transport TRU in Nuclear Regulatory Commission (NRC) certified Type B containers. DOE has chosen to have NRC approve these containers, e.g., TRUPACT-II, HalfPACT, RH-72B. Additional information may be found at: https://www.wipp.energy.gov/fctshts/TRUwastecontainers.pdf. The requirements and associated criteria for acceptance of defense TRU waste at WIPP for disposal are identified in the waste acceptance criteria (WAC). The acceptance criteria of the WAC describes the controlling (i.e., the most restrictive) requirements to be used by the DOE sites in preparing their waste for transportation to and disposal at WIPP. The WAC requirements are taken from several source documents from multiple regulators. The WAC is publicly available and can be found here: https://www.wipp.energy.gov/national-tru-program-documents.asp. The current version of the WAC (version 10) is dated 8/2020.
40	F.2.3.2 p.73	"This Act established the fee at $0.001 per kilowatt-hour of electricity generated from nuclear power and required that it be evaluated annually. The statutory fee remained unchanged until 2014 when, to comply with a November 2013 court ruling, the fee was adjusted to zero and the payment of fees by utilities was suspended. The balance of funds	Disposal remains a Federal government responsibility. The fee required by the Nuclear Waste Policy Act (NWPA) is intended to cover the costs incurred by the Federal government associated with disposal of commercial spent fuel and high-level waste. The ongoing fee was set to zero in 2014 based upon a court decision. However, the court decision also provided that DOE could resume collecting the fee in the future if it pursued a disposal plan that was authorized by Congress. The current balance of the Nuclear Waste Fund (NWF), which includes past fees collected and accrued interest, exceeds $43 billion. Prior to resuming collection of the fee, the Department of Energy (DOE) would have to evaluate and determine whether the NWF has insufficient or excess revenues to recover the costs incurred by the Federal government for its disposal activities under the NWPA and propose an adjustment to the fee, if appropriate, in order

Index	Reference	Question/Comment	Answer
		in the NWF continues to earn interest." Are there plans how the payment of fees suspended in 2014 will be replaced or how the provisions in 10 CRF 72.30 are going to be fulfilled?	to ensure full cost recovery. DOE would have to submit any such proposal for fee adjustment to Congress. The Nuclear Regulatory Commission requirements in 10 CFR 72.30 are for financial assurance to decommission storage facilities for spent fuel, high-level waste, and reactor-related greater-than-Class C low-level waste after such waste has been removed by the Federal government for disposal. These requirements are unrelated to the NWF fee.
41	D.2.1, page 41	The report states that "DOE is building the world's largest radioactive waste treatment plant at the Hanford Site in southeastern Washington State. …The plant is designed to operate for 40 years. This has been a challenging and complex project due to its size and technical scope". Is there a timetable for when this radioactive waste treatment plant will be completed?	As originally envisioned, the Waste Treatment and Immobilization Plant (WTP) to be built at the Hanford Site would treat high-level and low-activity radioactive waste simultaneously. WTP is a processing complex of five main facilities: Pretreatment (PT) Facility, Low-Activity Waste (LAW) Vitrification Facility, High-Level Waste (HLW) Vitrification Facility, Analytical Laboratory (LAB), and other supporting facilities collectively referred as Balance of Facilities (BOF). To begin treating waste as soon as practicable, the Department of Energy (DOE) developed a sequenced approach that begins to first treat certain low-activity waste using the direct-feed low-activity waste, or DFLAW, approach. This approach sends certain pretreated low-activity waste from the tank farms to the WTP's LAW Vitrification Facility. Meanwhile, high-level waste will be processed and vitrified later in a separate process, and DOE is in the process of determining the optimal solution. That solution will consider WTP's HLW Vitrification Facility as well as WTP's PT.
42	G7, page 113	The report states that "Currently, the U.S. has no spent fuel disposal capability" Is there a timetable for when a spent fuel disposal capability will exist?	For the past 10 years, Congress has appropriated no funds to the Department of Energy for a permanent disposal facility at Yucca Mountain or to the Nuclear Regulatory Commission (NRC) for the Yucca Mountain licensing proceeding. NRC's adjudicatory proceeding on the Yucca Mountain license application is currently suspended. There is no programmatic timetable for when spent fuel disposal capability will exist.
43	G7, page 113	The report states "It is currently believed that storing spent fuel longer than originally anticipated will not present a risk to safety". What are the elements that	As discussed in Section A.2.2 of the U.S. Seventh National Report, nuclear power reactor operator experience with the actual storage of spent fuel under the Nuclear Regulatory Commission's (NRC's) oversight and regulatory framework, and the continued application of proven fuel storage methodologies ensures spent fuel will be safely managed until a repository for disposal is available. Continued safe storage of spent fuel relies on a strong regulatory framework, including both licensee compliance and

Index	Reference	Question/Comment	Answer
		support the above hypothesis? Could you please specify what is meant by "longer".	regulatory oversight. NRC's regulatory framework provides for monitoring and oversight to address the potential for evolving issues and uses operational experience and scientific information collected and assessed during licensed operation to ensure the continued safe storage of spent fuel. As discussed in B.3.1 of the U.S. Seventh National Report, storage systems can be initially licensed for up to 40 years with possible renewals of up to 40 years, with no restriction on the number of renewals. Although there is no formal definition of "longer," periods longer than 40 years could be considered longer than anticipated. The 40-year licensing period does not necessarily equate to a design life for the system. Rather, spent fuel storage applicants must demonstrate the safety of the storage system design, including materials performance, for the requested license term. Renewal of licensing periods includes evaluation of degradation mechanisms and aging effects that may cause a reduction in the efficacy of storage system structures, systems, and components (SSCs). The requirements for spent fuel storage renewal include demonstration that aging and degradation will be addressed by either: (1) time-limited aging analyses that demonstrate that the SSCs continue to perform their intended functions for the requested renewal period, or (2) aging management programs to manage issues associated with aging, which could adversely affect SSCs during the requested renewal period. In addition, industry-led efforts such as the Extended Storage Collaboration Program (ESCP), coordinated by the Electric Power Research Institute, are also focused on the safety of continued storage and subsequent transportation of spent fuel (see Section A.3.1.2 of the U.S. Seventh National Report). Significant work continues both nationally and internationally to enhance the understanding of the degradation of spent fuel and storage systems, as well as the inspection and collection of operating experience. These efforts are consistent with NRC's regulatory approach to enhance understanding of potential degradation mechanisms associated with spent fuel storage. This enhanced understanding assists NRC with identifying potential concerns with the safe storage of the spent fuel, evaluating any such issues identified, and taking necessary actions to ensure the continued safe storage of spent fuel.
44	General	We would like to acknowledge and thank USA for the	Thank you for the complimentary comment on the U.S. Seventh National Report.

Index	Reference	Question/Comment	Answer
		comprehensive and very informative report.	
45	B.2.3.2, p.27	Can you please specify at which stage of management and to which volume (e.g. volume of drum) the concentration averaging takes place for the classification of LLW (Class A, B, C)?	In the U.S. classification system, licensees classify waste when the waste is ready for shipment to a licensed disposal site. Averaging volumes is addressed in guidance in the Branch Technical Position on Concentration Averaging and Encapsulation (CA BTP). The CA BTP can be found at: https://www.nrc.gov/waste/llw-disposal/llw-pa/llw-btp.html. Because averaging volumes is addressed in guidance rather than in regulation, there is flexibility in the averaging positions that are acceptable to the Nuclear Regulatory Commission. Sections 3.1 through 3.5 of the CA BTP provide generic averaging positions that apply to most waste, and Table 4 in Section 3.5 summarizes recommended averaging volumes and masses by waste type. Section 3.8 of the CA BTP provides general considerations for deviating from the specific values listed in the guidance.
46	F.4.3, p. 83	As it is stated in the report "Safety assessment computer models (e.g., RESidual RADiation [RESRAD]) are used to forecast exposures, prior to operating a nuclear facility, including spent fuel storage and radioactive waste disposal on a predictive basis." Are these models and assessment used also for post-closure public exposure prediction? If yes, could you please provide some information regarding the scenarios typically examined for LLW disposal and the timeframe covered for public exposure prediction?	Yes, modeling codes, including the Residual Radiation (RESRAD) Family of codes (which can be found at: https://resrad.evs.anl.gov/) and more specifically RESRAD-Onsite and RESRAD-Offsite, are used extensively at the Department of Energy (DOE) to perform scenarios examining post closure of low-level waste (LLW) disposal sites and potential public exposure. As part of a Performance Assessment (PA) of a LLW disposal site performed by DOE, two main types of scenarios are usually looked at during post-closure. One considers the natural and man-made processes that impact possible exposure routes, such as use of groundwater, and calculates dose using acceptable methodologies and parameters to a member of the public residing at the edge of the facility boundary. While not expected to occur, the second type of analysis relates to hypothetical intrusion scenarios, and both acute and chronic evaluations are performed. The acute exposure scenarios for hypothetical inadvertent intrusion considers direct intrusion into the disposal site and exhumation of accessible waste material. The hypothetical inadvertent intruder analysis considers the natural and man-made processes that impact the possible exposure and calculates the dose using acceptable methodologies and parameters. The chronic hypothetical inadvertent intrusion scenario considers a resident within the disposal facility boundary who receives dose from exposure pathways, including potentially disturbed waste, over a period of time (evaluated as an annual dose per year). The exposure pathways for the RESRAD modeling include all relevant ingestion, external exposure, and inhalation pathways for each exposure scenario.

Index	Reference	Question/Comment	Answer
			These exposures typically begin following a period of institutional controls (e.g., 100 years) and are evaluated for timeframes of 1,000 years (compliance period) to 10,000 years (evaluation period) post-closure of LLW site. If the peak dose for the PA is expected to occur after 1,000 years or even 10,000 years, then calculations should be extended for timeframes sufficient to determine the peak doses to support decisions. Quantitative calculation of impacts for sensitivity and uncertainty analysis must be carried out to address peak impacts that may occur after the compliance period. Regarding LLW commercial disposal sites in the U.S., only one commercial LLW disposal site has used RESRAD and it has since switched to site-specific modeling developed with GoldSim. RESRAD is currently used in the Tennessee Bulk Survey for Release Program to establish whether a given waste stream will meet the radiological waste acceptance criteria for very low-level waste (VLLW) disposal under the program. This is done for each waste stream, and is the approved modeling code for use at any of the four state-licensed commercial VLLW disposal facilities within the State of Tennessee. Regarding timeframes for commercial LLW disposal sites, the compliance period has been established by the Agreement State regulators and is site-specific. Values as short as 500 years as well as values exceeding 10,000 years have been used.
47	F.11, p. 104	Can you please provide more details (maybe a list if practical) for the post closure risk insights for the facilities for LLW disposal? How the question "How likely it is" is typically handled in practice, for post closure (Probabilistic analysis for quantitative determination of the probability, engineering judgment,...)?	The Nuclear Regulatory Commission (NRC) regulations at 10 CFR 61.23(b) through (e) and 61.23 (g) and the equivalent Agreement State regulations for sites regulated by an Agreement State require that the license issued for a waste disposal facility include plans for disposal site closure and post-closure institutional control. A licensee that is closing its disposal facility would amend its license by submitting an application with the pertinent information for site closure and post-closure. The list of information that NRC requires is at 10 CFR 61.28. This regulation can be found at: https://www.nrc.gov/reading-rm/doc-collections/cfr/part061/full-text.html#part061-0028.
48	G.7, p. 113	As it is stated in the report "The research focuses on sustainable fuel cycle options and	In order to prioritize the research and development (R&D) for sustainable fuel cycle options, the Department of Energy (DOE) Office of Nuclear Energy sponsored a Nuclear Fuel Cycle Evaluation and Screening Study, published in October 2014 and can be found

Index	Reference	Question/Comment	Answer
		technologies that minimize waste generation, improve safety, …". Can you please provide some information regarding the technologies that minimize waste generation in relation to spent fuel management and disposal? In relation to the future disposal facilities, are different types of facilities (large disposal facilities, deep boreholes, …) examined in the current research?	at: https://fuelcycleevaluation.inl.gov/SitePages/Home.aspx. The Study showed that, although a geologic repository will always be required, significant and meaningful waste reduction and improvement in fuel resource utilization can be achieved in recycle fuel cycle systems. Such systems would include recovery and reuse of spent fuel actinides (uranium and transuranic elements) in advanced reactors that operate with a fast neutron spectrum (this could be in concert with thermal spectrum reactors). As a result, DOE has been conducting research to develop advanced technologies for fast spectrum reactor systems, for recovery and reuse of used fuel actinides using electrochemical or simplified aqueous processes, and for robust and compact waste forms.
49	H.1.1, p. 116	Can you please specify for how long the licensee is responsible to maintain a monitoring system capable of providing early warning of release after the site is closed for LLW disposal?	In accordance with the Nuclear Regulatory Commission regulations at 10 CFR 61.53(d) and equivalent Agreement State regulations for sites regulated by an Agreement State, after the disposal site is closed, the licensee responsible for post-operational surveillance of the disposal site shall maintain a monitoring system based on the site's operating history and the closure and stabilization of the disposal site. The monitoring system must be capable of providing early warning of releases of radionuclides from the disposal site before they leave the site boundary. The specific requirements of the monitoring system, including the length of time it must be in place, are based on site-specific considerations.
50	J.1, p. 133	Please explain how sources and devices (e.g. smoke detectors) that are used by the general public and exempt from both registration and licensing are managed after their useful lifetime.	The Nuclear Regulatory Commission has licensing requirements for manufacturers and distributors of consumer products containing exempt quantities of radioactive material (see 10 CFR Part 32, Subpart A). However, the responsibility for managing these sources and devices when they become disused falls to the end-user, who must manage them according to manufacturer instructions and in compliance with applicable state and local requirements. Smoke detectors, for example, may be recycled or disposed of as ordinary trash unless prohibited by state or local requirements. In some cases, a manufacturer or distributor may offer to assist with reuse, recycling, or disposal. Additional information can be found at: https://www.nrc.gov/materials/miau/consumer-pdts.html.
51	K.1.2.1, p. 140	Would it possible to summarize some of the main differences of the new proposed regulation regarding the technical analysis	The main difference between the current and new proposed regulations in 10 CFR Part 61, is a requirement for a site-specific analysis for inadvertent intruder protection in situations where large quantities of depleted uranium are planned to be disposed at the facility. The Nuclear Regulatory Commission is still in a preliminary phase of the

Index	Reference	Question/Comment	Answer
		and criteria for LLW disposal? Is it anticipated that these changes will also be possible to apply to existing LLW disposal facilities or are relevant only to new near surface facilities.	rulemaking process (at the draft proposed rule stage); therefore, it is not possible to predict the final rule wording at this time.
52	K.2.2.3, p. 147	Are there specific additional safety requirements anticipated for engineered barriers or site characteristics (e.g. physical-geological barriers) posed by the new draft regulatory basis for near surface disposal of GTCC LLW, issued in July 2019 by NRC staff?	The draft regulatory basis issued in July 2019 specifies that "GTCC waste must be disposed at a minimum depth of 5 meters below the surface of the earth and with a 500-year intruder barrier in place." Further, it states, "GTCC waste could present an unacceptable hazard to an inadvertent intruder based on an excavation exposure scenario (e.g., GTCC waste buried within the depth for excavation of a dwelling). In accordance with 10 CFR 61.52(a)(2), Class C waste must be disposed of so that the top of the waste is a minimum of 5 meters below the top surface of the cover or the disposal unit must include intruder barriers that are designed to prevent access to the waste by an inadvertent intruder for at least 500 years. Because GTCC waste contains radioactive materials in greater concentrations than is present in Class C waste, the Nuclear Regulatory Commission (NRC) staff considers it reasonable that disposal of GTCC waste must meet both of these Class C requirements. Thus, the NRC staff assumes that GTCC waste would be disposed of at a minimum depth of 5 meters below the surface of the earth and must also be disposed of with a 500-year intruder barrier in place." NRC has not finalized this regulatory basis at this point; therefore, the final requirements for disposal of GTCC waste may change.
53	A.3.1.3	Section A.3.1.3 of the national report describes the progress of applications for Consolidated Interim Storage Facilities (CISF) for the interim storage of spent fuel and reactor-related Greater Than Class C (CTCC) Low Level Waste prior to final disposal in a deep geological disposal facility. 1. Could you please provide additional information on the role of these facilities in the national	The Department of Energy (DOE) is responsible pursuant to the Nuclear Waste Policy Act (NWPA) for disposition of spent fuel and high-level waste. In 2021, Congress appropriated funds to DOE for interim storage activities. Congress has recommended that DOE move forward under existing authority to identify potential sites for Federal interim storage facilities using a consent-based siting process. The purpose of one or more Federal interim storage facilities would be to receive spent fuel from nuclear power plant sites, which may include both shutdown and operating sites. Such a facility would enable DOE to begin meeting its obligations for disposition of spent fuel as required by the NWPA, as amended. A consolidated interim storage facility would provide consolidated storage capacity for storage of spent fuel from operating or decommissioned reactors.

Index	Reference	Question/Comment	Answer
		waste strategy. Please can you include: n Are these facilities intended to provide additional storage capacity for these waste types or are they replacing existing facilities? n Will these facilities take waste from decommissioned stations to facilitate site remediation or from operational sites to maintain capacity at these sites?	
54	A.3.1.4	Section A.3.1.4 of the national report describes how the DOE has (in 2019) provided clarification of the definition of High Level Waste (HLW) and in August 2020 completed an evaluation of the first waste stream applying this interpretation. 1. Please can you provide further information on the forward plan for the management and disposal of wastes which, utilising the 2019 interpretation, do not need to be disposed of in a deep geological disposal. In particular, whether this will allow for the important safety actions referred to in this section to be undertaken?	The Department of Energy (DOE) has conducted an environmental assessment of a second waste stream from the Savannah River Site proposed for disposal at a licensed commercial low-level waste facility under DOE's high-level radioactive waste interpretation. DOE currently does not have any plans to evaluate other waste streams. Any decisions about whether and how the interpretation will apply to other wastes at any specific site will be the subject of subsequent actions and following consideration of evaluation and characterization of specific reprocessing waste streams in conjunction with the waste acceptance criteria and requirements of a specific waste disposal facility; stakeholder input; and compliance with applicable Federal and State laws, regulations, and agreements.
55	K.2.2.5	The national report states that the capacity of WIPP is a subject of interest and that a new approach has been utilised to more accurately count against the WIPP	Under the Waste Isolation Pilot Plant Land Withdrawal Act (WIPP LWA), the total capacity of WIPP is limited by volume to approximately 1.76E+05 cubic meters (6.2E+06 cubic feet) of defense transuranic waste. The Department of Energy's (DOE's) Annual Transuranic Waste Inventory Report (ATWIR) serves as a current estimate of the transuranic waste inventory. The transuranic waste inventory estimates in the ATWIR

Index	Reference	Question/Comment	Answer
		statutory limit. 1. Could you please provide additional information on the current capacity (in m3) of WIPP and the volumes of current and future TRU waste streams? 2. Please can you describe the contingency plan should the capacity of WIPP not be sufficient.	have inherent uncertainties, and therefore, the inventory estimates change annually (e.g., changes due to waste minimization activities, packaging adjustments, technical and planning changes). As of the data collection cutoff date (December 31, 2020) for the 2021 ATWIR, approximately 70,100 cubic meters of transuranic waste have been disposed of at the WIPP facility (see https://wipp.energy.gov/library/TRUwaste/ATWIR-2021_CBFO_Final.pdf). By revising the method for counting defense transuranic waste disposed of at WIPP, which excludes some of the air space found in certain waste packages (e.g., overpacked containers), DOE has increased the likelihood that WIPP will have sufficient statutory capacity to dispose of the volume of waste estimated in DOE's 2020 ATWIR. In addition, DOE's plans include adding physical space at WIPP to meet future disposal needs without exceeding the statutory capacity. DOE will continue to closely monitor and track the actual transuranic waste volume emplaced at WIPP to ensure compliance with the WIPP LWA and will take action as appropriate, in a timely manner, to ensure the transuranic waste disposal needs of the DOE complex continue to be met.
56	D.2.1	Section 2.1 of the national report provides a description of the Waste Treatment and Immobilization Plant which is being built to treat defence waste from reprocessing. 1. Please can you provide an update on the progress of the Waste Treatment and Immobilization Plant which is being built at the Hanford Site, including when it is currently expected that this plant will begin to treat the waste streams.	The Department of Energy (DOE) continues with the construction of the Waste Treatment and Immobilization Plant (WTP) to disposition 56 million gallons of waste that are a byproduct of national defense plutonium-production efforts during World War II and the Cold War Era. This radioactive liquid waste resides in 177 aging underground tanks, ranging in capacity from 55,000 gallons to more than 1,000,000 gallons. The tanks contain the most complex heterogeneous radioactive waste at any U.S. cleanup site. Waste is in the form of sludge, salts, and liquids. No two tanks have the same combination of waste. There are over 1,800 different chemicals in the tank waste. WTP is a processing complex of five main facilities: Pretreatment (PT) Facility, Low-Activity Waste (LAW) Vitrification Facility, High-Level Waste (HLW) Vitrification Facility, Analytical Laboratory (LAB), and other supporting facilities collectively referred to as Balance of Facilities (BOF). To begin treating waste as soon as practicable, DOE developed a sequenced approach to first treat certain low-activity waste using the direct-feed low-activity waste, or DFLAW, approach. This approach sends certain pretreated low-activity waste from the tank farms directly to WTP's LAW Vitrification Facility. Meanwhile, high-level waste will be processed and vitrified later in a separate process, and DOE is in the process of determining the optimal solution. That solution will consider WTP's HLW Vitrification Facility as well as WTP's PT.

Index	Reference	Question/Comment	Answer
57	Annex D-2A	Table D-2A lists a number of waste disposal facilities. These facilities contain a mixture of LLW, MLLW (Mixed Low Level Waste) and TRU wastes. However, there appears to be no information in this report as to how these facilities are monitored to ensure that the waste is safely and securely disposed of. 1. Please provide an overview of the monitoring activities (of both waste and the surrounding land) that are undertaken of the various waste disposal sites listed for the Nevada National Security Site that are listed in D-2A to ensure that the waste is safely and securely disposed of.	The Department of Energy (DOE) Manual 435.1-1, Radioactive Waste Management, which complements DOE Order (O) 435.1, requires monitoring performed according to the form of radioactive waste. For the Nevada National Security Site (NNSS), the monitoring requirements below apply for the different waste streams currently located in NNSS and any other DOE radioactive waste site as required under DOE O 435.1 and Manual 435.1-1. The low-level waste (LLW) and mixed LLW monitoring activities include: All Waste Facilities: Parameters that shall be sampled or monitored, at a minimum, include temperature, pressure (for closed systems), radioactivity in ventilation exhaust and liquid effluent streams, and flammable or explosive mixtures of gases. Facility monitoring programs shall include verification that passive and active control systems have not failed. Liquid Waste Storage Facilities: For facilities storing liquid LLW, the following shall also be monitored: liquid level and/or waste volume, and significant waste chemistry parameters. Disposal Facilities: A preliminary monitoring plan for a LLW disposal facility shall be prepared and submitted to Headquarters for review with the performance assessment and composite analysis. The monitoring plan shall be updated within one year following issuance of the disposal authorization statement to incorporate and implement conditions specified in the disposal authorization statement. The site-specific performance assessment and composite analysis shall be used to determine the media, locations, radionuclides, and other substances to be monitored. Environmental Monitoring Program: The environmental monitoring program shall be designed to include measuring and evaluating releases, migration of radionuclides, disposal unit subsidence, and changes in disposal facility and disposal site parameters which may affect long-term performance. Radioactive waste management facilities, operations, and activities shall meet the environmental monitoring requirements established in DOE O 458.1, Radiation Protection of the Public and the Environment, and DOE Manual 435.1-1, ensuring dose limits are not exceeded for the representative person of the public or maximally exposed individual (MEI). Environmental Monitoring Programs shall be capable of detecting changing trends in performance to allow

Index	Reference	Question/Comment	Answer
			application of any necessary corrective action prior to exceeding the performance objectives for radioactive waste management at DOE sites. For transuranic waste disposal, it follows the same requirements as those for LLW and mixed LLW. Transuranic Waste: All waste facilities. Parameters that shall be sampled or monitored, at a minimum, include temperature, pressure (for closed systems), radioactivity in ventilation exhaust and liquid effluent streams, and flammable or explosive mixtures of gases. Facility monitoring programs shall include verification that passive and active control systems have not failed. Stored Wastes: All transuranic wastes in storage shall be monitored, as prescribed by the appropriate facility safety analysis, to ensure the wastes are maintained in safe condition.
58	A.3.6	Section A.3.6 describes new isotope production facilities. 1. Please can you describe the plans for ensuring that there are appropriate disposal routes for all the radioactive waste streams generated by the new isotope production facilities described within Section A.3.6.	In general, producers of medical isotopes are responsible for disposition of waste generated by new isotope production facilities. The Nuclear Regulatory Commission evaluates commercial disposition of radioactive waste for medical isotope facilities consistent with its regulations in 10 CFR Part 20, Subpart K, as part of its reviews of license applications. Under the American Medical Isotopes Production Act of 2012, the Secretary of Energy has established a program to make low-enriched uranium available, through lease contracts with the National Nuclear Security Administration, for irradiation for the production of molybdenum-99 for medical uses. Concurrent with the lease contract, the Department of Energy (DOE) will sign a take-back contract to retain responsibility for the final disposition of spent fuel or certain low-level waste without a commercial disposition pathway. The waste takeback contract will specify the producer's payment terms to DOE for transfer, storage, and ultimate disposal.
59	K.1.2	Section K.1.2 of the national report describes the NRC Transformational Activities to enhance the regulatory framework and separately discusses lessons learned at the DOE. 1. Please can you explain whether there are any initiatives to ensure	The Nuclear Regulatory Commission (NRC) and Department of Energy have periodic meetings at the management level to discuss all low-level waste activities that would be of interest to the other agency. Additionally, all regulatory changes (i.e., rulemakings) involve a public process. Comments are commonly received from the public, industry, and government agencies. Other government agencies are encouraged to comment on how the proposed regulatory changes will affect their requirements. NRC will consider and respond to all significant comments before any regulatory changes are made.

Index	Reference	Question/Comment	Answer
		that the improvements from these activities are shared across the USA's regulatory agencies.	
60	K.2.3	The national report states that "over the last several years over one-third of DOE's annual cleanup resources were spent for radioactive liquid tank waste stabilization and deposition. This investment is necessary to reduce technical uncertainties and risks associated with the cleanup work DOE must accomplish in the next several decades". 1. Please can you provide more details on the radiactive liquid tank waste stabilization and deposition work, including when it is anticipated to be completed. 2. Please can you explain what factors are taken into account in allocating resources from DOE to the various cleanup activities at legacy sites.	The scope to disposition radioactive liquid tank waste is to retrieve as much of the volume as technologically practical from the tanks and in matter that does not unnecessarily generate additional waste streams or create other hazards; treat and render the liquid waste in a solid form that is protective of human health and the environment and is compliant with waste disposal regulations and requirements; package and transport the stabilized waste to an appropriate waste management facility for permanent disposal; and treat and disposition of secondary waste. The tanks themselves will undergo a closure process. The disposition of tank waste and the closure of the tanks will require decades to complete. In general, the process for formulating budgets and planning program activities to accomplish legacy cleanup considers worker safety; public safety; environmental protection; requirements, commitments, and agreements; statutory requirements; other mission priorities; Departmental capabilities; and the Presidents' agenda. Input from Tribal Nations, stakeholders, impacted communities, and the public are actively sought and considered throughout the decision-making process, as well as through the course of cleanup.
61	K.2.4	Section K.2.4 of the national report describes a number of challenges identified for NRC and the activies undertaken to address them. 1. Please can you describe what, if any, challenges have been identified at DOE and EPA?	The Department of Energy (DOE) described a number of challenges in Sections K.2.2.1, K.2.2, K.2.2.4, and K.2.2.5 in the U.S. Seventh National Report. DOE also faces the following challenges which are discussed in the EM Strategic Vision: 2021–2031 (which can be found at: https://www.energy.gov/em/em-strategic-vision-2021-2031): Initiating tank waste treatment at Hanford, as well as completing significant risk reduction activities such as transferring cesium and strontium capsules to dry storage and placing the last of the former production reactors in interim safe storage; emptying and closing 22 of 51 underground waste tanks at the Savannah River Site, and

Index	Reference	Question/Comment	Answer
			completing disposal of remaining legacy transuranic waste; completing the new Safety Significant Confinement Ventilation System, utility shaft, and other key infrastructure upgrades at the Waste Isolation Pilot Plant; and completing disposal of remaining legacy transuranic waste and uranium-233 at Oak Ridge, along with completing construction of the site's new Mercury Treatment Facility. The Environmental Protection Agency's (EPA's) primary challenges over the next several years involve planned changes to the Waste Isolation Pilot Plant disposal system that would increase the underground area/footprint of waste disposal operations. DOE intends to add at least two new waste panels in the near term in previously unexcavated areas of the repository, and potentially additional panels in subsequent years. DOE will submit information for EPA review and approval prior to mining any new panels. EPA will also be reviewing plans for DOE to dispose of additional volumes of surplus plutonium in the repository. Maintaining expertise with agency staff and contractor staff is an ongoing general challenge.
62	F4.2.1 & Table F3	The USA national report in section F4.21 and table F3 states the effective dose limit for workers as 50 mSv/yr and the equivalent dose limit is 150 mSv/yr. These dose limits are significantly higher than those specified within GSR part 3, Schedule III. 1. Is USA going to adopt this latest standard? 2. If so, please can you explain the timescales? 3. If not, please can you explain the rationale for this decision?	The Nuclear Regulatory Commission (NRC) does not plan to adopt the standard. A recent review by NRC found that the occupational dose limit of 50 mSv/year is adequately protective and through as low as reasonably achievable (ALARA) requirements the average dose of our licensees rarely exceeds 20 mSv/year, or 100 mSv over 10 years (see Enclosure 5: Issue Paper 4 - Individual Protection - ALARA Planning, which can be found at NRC's Agency-wide Documents Access and Management System, under ML14084A340). NRC has no current plans to update the radiation protection limits because the current system with the ALARA requirement adequately protects public health and safety as shown through operational experience.
63	F4.2.3, page 81	The USA national report in section F4.2.3 refers to 2 final states for	The radiological criterion for termination of licenses under unrestricted conditions is a total effective dose equivalent to the average member of the critical group of less than

Index	Reference	Question/Comment	Answer
		license termination, restricted and unrestricted use. 1. Please could you provide further details on these end states, in terms of the radiological protection criteria used? 2. Could you explain the basis for these criteria?	25 mrem (0.25 mSv) per year and is found at 10 CFR 20.1402. The 10 CFR 20.1403 radiological criteria for license termination under restricted conditions are: (1) 25 mrem (0.25 mSv) per year under legally-enforceable institutional controls; or (2) less than 100 mrem (1 mSv) per year if institutional controls are no longer in effect; or (3) 500 mrem (5 mSv) per year if institutional controls are no longer in effect and the licensee demonstrates that further reductions are not technically feasible, it made provisions for durable institutional controls, and sufficient financial assurance is provided. The technical basis for establishing the radiological criteria and the regulatory requirements is provided in the final rule, Radiological Criteria for License Termination (62 FR 39058, July 21, 1997).
64	A.3.2.2, 11	A.3.2 describes the review for alternative disposal requests to LLW disposal and status of VLLW scoping study. - The alternative disposal requests is carried out case by case. Is the same procedure applied when application for alternative disposal is repeatedly made with the same method? What is the difference between the alternative disposal requests and concept of clearance?	Alternative disposal requests are case-by-case reviews to determine the acceptability of disposal in a non-10 CFR Part 61 disposal facility not licensed by the Nuclear Regulatory Commission (NRC) or an Agreement State. Generally, one regulatory review can be used for similar alternative disposal requests. Ideally, an applicant would identify the plans for multiple disposal campaigns in their application so that only one review and approval would be required. Regarding clearance, the concept of clearance was not finalized in our regulations. However, it was envisioned to be a generic approval process that could be used without the need for case-by-case approvals by the regulator (either NRC or an Agreement State).
65	F.2.3.5, 75	Are there regulatory measures prepared to employ in cases where a nuclear facility needs permanent shutdown and decommissioning due to safety issues based on the regulatory body's decision, but the merchant plant licensee does not provide assurance from the financial perspective?	For licensees that will not be able to recover decommissioning costs through regulated rates and fees or other mandatory charges, the Nuclear Regulatory Commission (NRC) requires up-front assurance in the form of prepayment or some type of surety mechanism. As discussed in the Federal Register Notice for the final rule, Financial Assurance Requirements for Decommissioning Nuclear Power Reactors, this up-front assurance is necessary to ensure that reasonable financial assurance is provided for all decommissioning obligations (63 FR 50469, Sept. 22, 1998). If a facility is required to permanently cease operations prior to its operating license termination date, and a funding shortfall is identified, NRC will evaluate any such scenario on a case-by-case basis. NRC reserves the right to take additional steps, in accordance with NRC regulations, including conducting a review of the rate of accumulation of decommissioning funds, and to take additional actions, either independently or in

Index	Reference	Question/Comment	Answer
			cooperation with the U.S. Federal Energy Regulatory Commission and the licensee's State public utility commission, as appropriate.
66	G.6, 111	As we understand, inspection is carried out on the manufacturers of spent fuel storage casks outside the U.S. Is this inspection done on all storage casks or some selected ones?	The Nuclear Regulatory Commission (NRC) inspects foreign manufacturing facilities of spent fuel storage cask designers that have a cask design approved in the U.S. NRC inspects the foreign facilities of cask designers that manufacture the cask systems themselves outside the U.S. or contract out the manufacturing of casks to companies outside the U.S. NRC Inspection Manual Chapter (IMC) 2690 (which can be found at NRC's Agency-wide Documents Access and Management System, under ML20338A192) describes NRC inspection program for spent fuel storage cask design and fabrication, among other related activities. Details on the inspection of cask fabricators and cask components are found in IMC 2690, Appendix A, Inspection Program Guidance for ISFSIs. Table A-1 of the Manual provides information on the inspection intervals and changes in inspection frequency based on performance. NRC conducts inspections of spent fuel cask fabrication activities at each foreign and domestic manufacturing facility every three years while fabrication activities are ongoing. Therefore, NRC inspections are performed on casks every three years at each facility, rather than on all fabricated storage casks. The inspection program is designed to increase the frequency of inspections when an inspection identifies performance issues at a facility.
67	H.3.1~3.2, 120~122	H.3.2.1 and 3.2.2 describe the surface contaminated and volumetrically contaminated radioactive material releases. - US NRC did not adopt ANSI/HPS N13.2. What is the reason for this?	The Nuclear Regulatory Commission (NRC) has not endorsed ANSI/HPS N13.12-2013, Surface and Volume Radioactivity Standards for Clearance. Current NRC guidance on approaches to unrestricted release of materials and equipment with volumetric contamination is provided in NUREG-1757, Vol. 1, Rev. 2, Section 15.11. The existing guidance is that releases of volumetrically contaminated solid material may be approved, pursuant to 10 CFR 20.2002, under an annual dose criterion of a "few mrem," and are reviewed by NRC on a case-by-case basis.
68	J.2, 134	It is stated in J.2 that licensees possessing disused sealed sources are responsible for properly storing the sources. - Are licensees regulated and controlled to ensure they do not hold disused sealed sources for an extended period of time? - Is this defined as a regulatory requirement?	In general, the Nuclear Regulatory Commission (NRC) licensees may store disused sealed sources indefinitely as there are no regulatory time limits placed on storage. One exception is the requirement for prompt decommissioning provided in NRC's decommissioning Timeliness Rule (see 10 CFR 30.36(d)). The Timeliness Rule applies to situations when: (1) the licensee has decided to permanently cease principal activities at the entire site; or (2) no principal activities have been conducted for a period of 24 months, even if no decision has been made to permanently cease principal activities. If a sealed source licensee has not conducted any principal activities for 24 months, the Timeliness Rule would apply and the licensee would be required to initiate applicable decommissioning activities. However, the rule would not apply to situations where

Index	Reference	Question/Comment	Answer
			individual sealed sources are in long-term storage, but the licensee is still conducting principal activities.
69	J.2, 135	It is stated in J.2 that under the OSRP, DOE/NNSA recovers, securely stores, and disposes, as appropriate, commercially licensed sealed sources that pose a threat to national security and/or public health and safety. - It seems the sources under OSRP include sources held by a managing organization, not orphan sources. Does OSRP manage those sources even though they are managed by a licensee?	The radioactive sources collected by the Off-Site Source Recovery Program (OSRP) are disused and unwanted. Prior to recovery by OSRP, these sources are licensed by the Nuclear Regulatory Commission or Agreement States and managed by the owner/license holder (except in the rare instance of an orphan source). Upon recovery, the ownership of these sources is transferred to the Department of Energy and managed appropriately until disposal.
70	K.2.2, 146	It is stated that some problematic wastes do not meet the waste acceptance criteria for a repositories. -If wastes, other than calcine solids and sodium-bearing waste, fail to meet acceptance criteria, what kinds of wastes are they? What measures are being considered to make them meet the disposal criteria?	Some of the waste may be classified as transuranic waste, low-level waste (LLW) or Greater than Class C LLW. For those waste streams that do not meet a disposal criteria, additional treatment/conditioning may be required to meet the waste acceptance criteria. Examples of actions taken may be to sort/segregate components in the waste, remove prohibited items, treat to remove hazardous or other characteristics, treat sodium or reactive metals, add shielding to limit external exposures, or repackage to limit the fissile waste loading in a particular container. There are commercial firms in the U.S. that have expertise in radioactive waste treatment providing services to find unique ways to disposition such waste.
71	F.7.3, F.7.4	The designer and manufacturer of the spent fuel shipping containers may differ. At which stage does the assessment on the design quality assurance plan and manufacturing quality assurance plan take place, either design assessment stage or fabrication	Transportation and therefore, transportation casks are not within the scope of the Joint Convention. Please refer to: https://www.nrc.gov/materials/transportation.html for more information on transportation.

Index	Reference	Question/Comment	Answer
		inspection stage? - In the case of the design of shipping containers approved by US NRC, if fabrication is made for export, are another partial design changes due to the request of the importing country not allowed without further approval from the US NRC?	
72	G	In the case of spent nuclear fuel storage casks, the designer and manufacturer may differ. At which stage does the assessment on the design quality assurance plan and manufacturing quality assurance plan take place, either design assessment stage or fabrication inspection stage?	The Nuclear Regulatory Commission (NRC) regulations in 10 CFR Part 72, Subpart G require that the designer of a spent fuel storage cask establish a quality assurance program that includes all activities from development of the spent fuel storage cask design through the eventual termination of the cask design approval. Fabrication activities that occur after the design of the cask are also included. In addition, the eighteen quality assurance criteria (10 CFR 72.142 – 10 CFR 72.176) require that all quality assurance programs for cask designers contain quality assurance criteria applicable to both design and fabrication activities. Therefore, the quality assurance program applicable to both design and manufacturing activities is assessed at the design assessment stage and is required to be approved before commencing fabrication or testing of a spent fuel storage cask. Further, the Certificate of Compliance (CoC) holder of an NRC-approved spent fuel storage cask design is responsible for ensuring manufacturing quality assurance. The CoC holder's responsibilities continue if a separate manufacturing company fabricates the spent fuel storage casks; the CoC holder must perform surveillance during component fabrication. The involvement of general and specific licensees that will use the storage cask is recommended to ensure the casks meet the needs of the end-user and that fabrication is of high quality. The CoC holder reviews and accepts the manufacturer’s quality assurance program as satisfying the required quality assurance criteria for fabrication.
73	F.7.3	It is stated that the U.S. manages the interfaces between various steps, e.g. storage, transportation, and disposal. As per the spent nuclear fuel shipping containers, do you have the design life or maximum times of use decided	Transportation, and therefore, transportation casks are not within the scope of the Joint Convention. Please refer to: https://www.nrc.gov/materials/transportation.html for more information on transportation.

Index	Reference	Question/Comment	Answer
		for them? Or is there a separate procedure to check the integrity of casks such as aging assessment at a certain time or under certain conditions?	
74	G	When licensing the dry storage facility for spent fuels, is the period of permit given based on the storage cask design life and is the licensee required to apply for the permit for continued operation? If so, what is the period of permit and when does the licensee have to apply for continued operation? Or, is there a separate procedure similar to continued operation such as replacement of casks?	As discussed in B.3.1 in the U.S. Seventh National Report, storage systems can be initially licensed for up to 40 years with possible renewals of up to 40 years, with no restriction on the number of renewals. The 40-year licensing period does not necessarily equate to a design life for a specific system. Rather, spent fuel storage applicants can apply for a term of up to 40 years but must demonstrate the safety of the storage system design for the requested license term. After the initial license term, the licensee may apply for a renewal of the storage system or facility. As described in Section G.2 in the U.S. Seventh National Report, typical examinations for spent fuel storage renewals evaluate degradation mechanisms and aging effects that may cause a reduction in the efficacy of storage system structures, systems, and components (SSCs). The requirements for spent fuel storage renewal include demonstration that aging and degradation will be addressed by either: (1) time-limited aging analyses that demonstrate that the SSCs continue to perform their intended functions, or (2) aging management programs to manage issues associated with aging, which could adversely affect SSCs. Aging management programs consist of condition monitoring, performance monitoring, inspections, mitigation, repair, or replacement activities for each SSC, upon consideration of its material of construction, service environment, condition, and any related operating experience.
75	F.7.3, F.7.4	Is there a provision which allows an interim storage of spent nuclear fuels that are not declared as radioactive waste, outside the site?	The Nuclear Regulatory Commission (NRC) regulations for the storage of spent fuel at 10 CFR Part 72 are based on the radiological hazard of the materials, rather than the specific type or name of radioactive material to be stored. The type and location of a specific storage facility, the amount of waste to be stored, site-specific hazards (e.g., flooding, seismicity), and the location of the site boundary require different approaches to ensure safety. Under NRC regulations, licensees may store spent fuel in dry cask storage systems at independent spent fuel storage installations (ISFSIs) at a reactor site or away-from-reactor site (see https://www.nrc.gov/waste/spent-fuel-storage.html).

Index	Reference	Question/Comment	Answer
			A Consolidated Interim Storage Facility (CISF) is an ISFSI for purposes of NRC regulations; CISFs are subject to the ISFSI requirements in NRC regulations in 10 CFR Part 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste," (which can be found at: https://www.nrc.gov/reading-rm/doc-collections/cfr/part072/index.html). Thus, a CISF could be co-located at a power reactor site, but to date, no applicants have proposed a CISF to be co-located with a power reactor. See the Answer to Question 110 regarding the status of the two CISFs applications NRC received.
76	F.7.4, F.7.5	Does the Department of Energy have its own management standards for spent nuclear fuels, other than the standards for safe handling, storage, disposal of spent nuclear fuels provided by the regulator?	As a matter of policy, the Department of Energy (DOE) has committed to providing the same level of protection for spent fuel as comparable commercial entities that are regulated by the Nuclear Regulatory Commission (NRC). Some DOE spent fuel storage facilities are licensed by NRC, and NRC requirements apply. For certain other activities, such as spent fuel transportation, DOE has developed its own requirements that are comparable to NRC regulations.
77	Pag 10, A.3.1.4	Being the NRC "the regulatory authority over spent fuel, special nuclear material sufficient to form a critical mass, and HLW" (from E.2), has the NRC had any contribution during the process for the modification of the interpretation of HLW definition mentioned in A.3.1.4? Could the new criteria for excluding certain waste from being HLW affect other streams different to those foreseen by the DOE as a result of the reprocessing of spent fuel (for example those generated during the operation of commercial facilities), affecting tis way the radioactive waste inventories?	The Nuclear Regulatory Commission (NRC) reviewed and commented on the Department of Energy's (DOE's) Request for Public Comment on the U.S. Department of Energy Interpretation of High-Level Radioactive Waste (83 FR 50909, October 10, 2018), and DOE modified its high-level waste (HLW) interpretation criteria in consideration of NRC's comments, as discussed in DOE's Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste (84 FR 26835, June 10, 2019). DOE places significant weight on NRC's views of matters relating to the safe management and disposal of radioactive waste, including the HLW interpretation. The HLW interpretation is only applicable to reprocessing waste inventories from atomic energy defense activities and would not apply to reprocessing waste from the operation of commercial facilities. More recently on December 21, 2021, DOE published an affirmation of its DOE HLW Interpretation, after additional consideration and dialogue with its stakeholders (86 FR 72220). The 2021 criteria are the same as the criteria published in the 2019.

Index	Reference	Question/Comment	Answer
78	Pag 11, A.3.2.2	Is there any calendar or prediction on when the regulatory scheme might be updated in order to accommodate the particularities for the management of VLLW?	A schedule for completing this action cannot be made at this time because the staff's recommendations in SECY-20-0098 (which can be found at the Nuclear Regulatory Commission's Agency-wide Documents Access and Management System, under ML20143A164) are under consideration by the Commission. The timing and content of the Commissioners' response will determine when the regulatory scheme will be updated.
79	Pag 18, A.3.7.4	The NRC is requested to compile a report to the US Congress on best practices for establishing and operating local community advisory boards, which also makes reference to lessons learned. Have you drawn any especially relevant recommendation from the last report on 2020? Is it foreseen or requested for this report to be issued again in the future?	The Nuclear Regulatory Commission (NRC) does not anticipate issuing a revision to its July 2020 report on local community advisory boards. In the report's conclusion, NRC encourages the formation of community advisory boards and identifies seven best practices that pertain to when to establish a board, development of a charter, consideration of local preferences, membership diversity, meeting frequency and topics, funding sources, and access to experts and training.
80	Pag 58, E.2.1.5	From the US report: "As of June 2020, 39 of the 50 states have entered into agreements with NRC. These states are called Agreement States. NRC and the Agreement States work together as co-regulators to ensure the uniform protection of public health and safety across the U.S. from the use of radioactive materials. Collectively, this collaborative effort between NRC and Agreement States is referred to as the National Materials Program". The Nuclear Regulatory Commission's Integrated Materials Performance Evaluation	Recommendations identified during an Integrated Materials Performance Evaluation Program (IMPEP) review are specific to the Agreement State or Nuclear Regulatory Commission (NRC) program being reviewed. A recommendation is written in response to a programmatic deficiency identified during the IMPEP review. All recommendations included in the final report require a response from the agency. The agency will inform NRC of the corrective action to be taken to correct the programmatic deficiency. Recommendations are subsequently followed up at the next periodic meeting held midway between IMPEP reviews and the next IMPEP review to determine if the agency's action was effective in correcting the issue.

Index	Reference	Question/Comment	Answer
		Program (IMPEP) offers the opportunity to identify good practices and lessons learned from the assessment of the performance of both Agreement State and NRC Radioactive Material Programs. How are the recommendations arising from this program implemented or followed up? Are the recommendations consistently applied through the different Agreement States or only applied to the Agreement State subject to the assessment that led to the recomendation?	
81	Pag 68, E.2.4.2	Last paragraph of the section (E.2.4.2) contains a good set of examples on how the NRC assists to states entering into agreements. However, being the radiation protection program or regulation developed by the Agreement State itself, should there is any conflict or controversy between the general NRC's regulation and the specific one for the State, how would it be solved or arbitrated? The regulatory developments by the Agreement States are requested to be more protective/ restrictive than the Nuclear Regulatory Commission's. Isn't this request a source of	Agreement States are required to have regulations that are compatible with the Nuclear Regulatory Commission (NRC) regulations to ensure that there are no conflicts, duplications, gaps, or other conditions that would jeopardize an orderly pattern in the regulation of radioactive materials on a national basis. Agreement State regulations required for basic radiation protection standards (such as dose limits), definitions necessary for a common understanding of radiation protection principles (such as signs, labels, or terms), and activities that cross jurisdictional boundaries must be essentially identical to those of NRC's regulations. For other regulations, Agreement States have the flexibility to be more restrictive than NRC. The categorization criteria used to determine the appropriate "compatibility" category for each section of the regulation is done during the rulemaking process. As part of the periodic Integrated Materials Performance Evaluation Program review of each Agreement State, NRC evaluates each State to ensure that they maintain regulations that are compatible with NRC.

Index	Reference	Question/Comment	Answer
		uncertainty to potentially have different levels of radiation protection depending on the regulating State?	
82	Pag 141, K.1.4	The activities looking forward to the transformation of the NRC started a few years ago and several initiatives were launched. However, the pandemic must have affected the deployment of these activities (i.e. technology adoption, processes simplification, etc.) and maybe some of those will need to be reconsidered once the health crisis is over and normal operation can be resumed. Could you please briefly share how has the NRC transformation effort been particularly impacted/affected by the COVID pandemic?	While the pandemic presented many challenges, it accelerated the Nuclear Regulatory Commission's (NRC's) transformation efforts. For example, the initial work done with the technology adoption prior to the pandemic was critical in helping us quickly transition to working remotely during the COVID-19 public health emergency. Employees have been embracing new technologies. Additionally, the Be riskSMART Initiative developed a framework to give staff confidence in accepting well-managed risks in decision-making without compromising NRC's mission. This framework can be used in the legal, corporate, and technical areas. This framework also played an important role during the pandemic to assess licensing actions and emergent safety and security issues. At this time, NRC has been able to fully integrate six of the seven initiatives into its normal business processes, and as we progress on our transformation journey, we will continue to strengthen our culture of openness to innovation as an institutional norm.
83	B.3.2 Spent Fuel Disposal	According to the Nuclear Waste Policy Amendments Act of 1987 Yucca Mountain is still the selected site for spent nuclear fuel even though the adjudication on the application is suspended. Thus authorization by Congress, amendment to the Nuclear Waste Policy Act (i.e. deselecting the Yucca Mountain site) seems necessary in order to go forward with other potential spent fuel repository sites. Have there been any indications that any of this	For the past 10 years, Congress has appropriated no funds to the Department of Energy (DOE) for a permanent disposal facility at Yucca Mountain or to the Nuclear Regulatory Commission (NRC) for the Yucca Mountain licensing proceeding. NRC's adjudicatory proceeding on the Yucca Mountain license application is currently suspended. In 2021, Congress appropriated funds to DOE for interim storage activities. Congress has recommended that DOE move forward under existing authority to identify potential sites for Federal interim storage facilities using a consent-based siting process. In the near-term, DOE will focus its efforts on siting one or more Federal interim storage facilities.

Index	Reference	Question/Comment	Answer
		will happen during the present Biden-Harris administration? Or are there any plans to restart the licensing of Yucca Mountain repository?	
84	F.7.8 Public and Stakeholder Involvement	The U.S. Sixth National Report mention (section F.7.8.) that DOE facilitates public and stakeholder involvement in issues related to radioactive waste management. That includes provide financial support for self-organized regional and tribal committees. Does that include financial support to non governmental organizations like environmental organizations? Regarding a future site for spent nuclear fuel, will the financial support for stakeholder involvement continue after one or several sites have been selected? Will stakeholder support activities at the local level continue during the entire process?	In 2021, Congress appropriated funds to the Department of Energy (DOE) for interim storage activities and recommended that DOE move forward under existing authority to identify potential sites for Federal interim storage facilities using a consent-based siting process. In December 2021, DOE issued a request for information (RFI) on a consent-based siting process that would be used to identify sites to store the nation's spent fuel. The information will be used to develop DOE's consent-based siting process and overall waste management strategy. DOE is committed to a consent-based siting approach that makes communities and people central in the process. This will give the nation its best chance at success in solving the decades-long stalemate over how to effectively disposition spent fuel. DOE may issue a funding opportunity announcement (FOA) or other solicitation in the future based on or related to the content and responses to the consent-based siting RFI. DOE plans to have any such FOA be open to interested groups and communities. Final details, including the anticipated award size, quantity, and timing of DOE-funded awards, would be subject to available appropriations.
85	D.3.1 Departmen t…	After site cleanups, how many sites are concidered as a potential risk and have been transferred to DOE's office of Legacy Managment (LM) for continued long term surveillance and maintenance? How many more sites can it be antipicated that LM will be responsible for in the future? For how long will this long term surveillance and	With regard to risk, the Department of Energy (DOE) Office of Legacy Management (LM) receives sites from DOE Office of Environmental Management after the cleanups are completed; therefore, in terms of absolute risk, the risk profile is very low. Nevertheless, LM maintains a risk ranking index of relative risk within the LM portfolio. DOE uses the LM risk ranking index to prioritize funding for special projects designed to further reduce exposure to risk. LM is anticipating 52 more sites, resulting in a total of 153 sites to transition by 2070. DOE also identified another 3 sites where transition dates can't be estimated. Long-term surveillance and maintenance are expected to continue in perpetuity into the

Index	Reference	Question/Comment	Answer
		maintenance continue, how is it financed and how much will it potentially cost?	future. LM funding is granted by legislation that the President signs each fiscal year as part of the budgeting or appropriation process. LM maintains a 75-year baseline of funding requirements to manage its sites.
86	D.3.1 Departmen t…	The work done by the Legacy Management (LM) is a very interesting example of how long term surveillance and maintenance after facility closure can be done in practice. Is LM also comitted to educating/informing the public and stakeholder (local community, decision makers etc.) regarding for instance why post-closure activites are needed as well as why and when the long surveillance and maintenance period can be ended? If decisions have been made to end the long surveillance and maintenance at a legacy site, have this caused any oposition in the local communites? Are these sites marked in any way? If so, what kind of marking strategy have been put forward? Are there regular controlls of the marker/signs understandibility and is there any marker design harmonization between sites? For the legacy sites that are reused, what challenges and benefits have been observed when reusing the legacy sites? It would be interesting to know more about LM's work to preserve knowledge	A large part of the Department of Energy Office of Legacy Management (LM) mission includes stakeholder interaction to gain a better understanding of the communities near LM facilities, as well as to accomplish competent, long-term surveillance and maintenance. This includes educating the local public about the respective LM site history through planned engagement activities. LM often partners with local governments to provide information about the LM site and explore opportunities to redevelop LM sites (e.g., into parks, interpretive centers), as appropriate. LM has not decided to end long-term surveillance and maintenance at an LM site. Yes, LM sites are marked. LM maintains existing signage and may augment the signage effort at a site, if needed, to ensure safety of the site and members of the public. The strategy is different for every site and depends mostly on the proximity to a populated area and likelihood of trespassers. LM considers signage/marking an important part of long-term surveillance and maintenance. Yes, there are controls of the marker/signs. LM sites are inspected annually, at a minimum, which includes ensuring markers/signs are legible and secure. Depending on the regulatory framework of a site, site markers/signs are generally consistent in color and design but may vary to best serve the local community. Some LM sites have been converted to be reused by the public (e.g., visitor centers, wildlife refuges, walking trails, dog parks). These converted sites are generally viewed as beneficial resources to affected communities. Once established, many visitors make use of walking trails because they offer opportunities to view wildlife, especially in suburban settings. These types of reuses increase positive public perception of LM sites. LM produces a quarterly newsletter that highlights many of our efforts to preserve records and community interactions. LM efforts are generally guided by community desire and LM mission goals. Each site is treated uniquely in terms of preserving the site history within a community. LM uses many multi-media ways to share the legacy and history of our sites, including, fact sheets, videos, websites, social media, public

Index	Reference	Question/Comment	Answer
		and memory of the legacy sites that are under long term surveillance and maintenance and any references describing this would be greatly appreciated.	outreach, and others. Additional information on LM can be found at: https://www.energy.gov/lm/office-legacy-management.
87	H.2.2 Siting Proposed Facilities	A strategy document from DOE (2013) titled "Strategy for the management and disposal of used nuclear fuel and high-level radioactive waste" emphasize the need for a consent-based siting process. The five criteria stated in the report do not seem to include societal acceptance as a key factor in the site selection process. Can you please clarify whether or not the siting strategy for proposed facilites inlcudes a consent based process.	The Department of Energy is committed to the consent-based siting approach that makes communities and people central in the process to give the nation its best chance at success in solving the nation's decades-long stalemate over how to effectively manage our spent fuel. Additional summary level information can be found at: https://www.energy.gov/ne/consent-based-siting; https://www.energy.gov/articles/doe-restarts-consent-based-siting-program-spent-nuclear-fuel-requests-input-interim; and https://www.federalregister.gov/documents/2021/12/01/2021-25724/notice-of-request-for-information-rfi-on-using-a-consent-based-siting-process-to-identify-federal.
88	Section F	Considering the proposal of the IRRS 2014 follow-up mission saying that "NRC should consider developing a consolidated rulemaking and corresponding guidance in order to facilitate the orderly transition from operation to decommissioning" (IAEA-NS-2014/01 report, IRRS Follow-up Mission to the USA), could you provide more detailed information on how this proposal has been implemented?	In 2018, the Nuclear Regulatory Commission (NRC) staff prepared a draft proposed rule for decommissioning of production and utilization facilities and provided it to its Commission for consideration (SECY-18-0055). On November 3, 2021, the Commission approved publication of the proposed rule subject to certain changes which can be found at NRC's Agency-wide Documents Access and Management System, under ML21307A046. The proposed rule is currently on track to be published in March 2022.
89	Section K	What are the main funding sources for the cleanup of non-defense legacy sites?	The Congress appropriates funds for the cleanup of Department of Energy non-defense legacy sites such as the legacy gaseous diffusion sites which are funded through the Uranium Enrichment Decontamination and Decommissioning Fund.

Index	Reference	Question/Comment	Answer
90	General	INFCIRC/603/Rev7 presents the definition of a Good Practice stating the criteria of a significant contribution to the safety as its key provision. Please, indicate what criteria of significant contribution to the safety govern the decision-making on denoting some specific program, policy or practice as a Good Practice?	INFCIRC/603/Rev7 notes that a good practice is "a new or revised practice, policy or program that makes a significant contribution to the safety of radioactive waste and spent fuel management. A Good Practice is one that has been tried and proven by at least one Contracting Party but has not been widely implemented by other Contracting Parties; and is applicable to other Contracting Parties with similar programs." The U.S. does not apply predetermined criteria to define what constitutes a "significant contribution to safety," as there is a wide range of possible safety benefits depending on the nature of the activity proposed as a good practice. Safety benefits could be short-term (e.g., public or occupational dose reduction), medium-term (e.g., reduced impacts to the environment), long-term (e.g., reduced risk to future generations), or encompass multiple benefits over time. Discussion among Contracting Parties at the Review Meeting is the best approach to determining whether a proposed best practice satisfies the INFCIRC definition. The U.S. also notes that the process for identifying good practices is the subject of a proposal to be discussed at the upcoming Extraordinary Meeting. This topic could be further explored by the Open-Ended Working Group at the 7th Review Meeting.
91	General	Promotion of progress in nuclear safety is seen as an objective of the Joint Convention. Based on which estimated safety indicators you conclude on the progress associated with the safety of storage facilities?	The best safety indicator is the safety record that there have been no releases of spent fuel storage cask contents or other significant safety problems from the dry cask storage systems in use today. The Nuclear Regulatory Commission (NRC) promotes the continuation of this excellent safety record by: -Maintaining and enhancing regulatory programs, using information gained from domestic and international operating experience, lessons learned, and advances in science and technology. -Further risk-informing the current regulatory framework in response to advances in science and technology, policy decisions, and other factors, including prioritizing efforts to focus on the most safety-significant issues. -Enhancing the effectiveness and efficiency of licensing and certification activities to maintain both quality and timeliness of licensing and certification reviews. -Maintaining effective and consistent oversight of licensee performance with a focus on

Index	Reference	Question/Comment	Answer
			the most safety-significant issues. -Identifying, assessing, and resolving safety issues. -Verifying that spent fuel storage facilities are constructed and operated in accordance with permits and licenses and that the environmental and safety regulatory infrastructure is adequate to support the issuance of new licenses. NRC requires licensees for storage facilities to provide a description of their aging management program in renewed storage facility licenses and renewed certificates of compliance for casks. NRC uses the inspection process to determine whether licensees have adequate processes or procedures planned or in place to implement approved aging management programs consistent with the requirements of 10 CFR Part 72. For example, NRC requires that the collection of appropriate information and the implementation of aging management activities are part of license renewals. These include: (1) time-limited aging analyses that demonstrate that the structures, systems, and components (SSCs) important to safety continue to perform their intended functions; and (2) aging management programs for specific issues known to be associated with aging, which could adversely affect SSCs important to safety. Information collected for the aging management program is a useful indicator of safety progress. As discussed in Section A.3.1 of the U.S. Seventh National Report, some specific examples of progress in the safety of spent fuel storage include: the Department of Energy (DOE) research and development activities for spent fuel and high-level waste and NRC's review of two applications for consolidated interim storage facilities. Additionally, as discussed in Section G.6, NRC's regulations and its licensing and inspection programs address numerous aspects of spent fuel storage activities, including the storage of spent fuel at independent spent fuel storage installations, approval of storage cask designs, and the safe operation of the storage casks and storage facilities.
92	General	Is there any practice in place to rank nuclear facilities according to their hazard level? If so, what are its main principles and /or methodology?	The Department of Energy (DOE) uses the process outlined in a DOE Directive for assigning hazard categories for DOE nuclear facilities (DOE-STD-1027-2018, Hazard Categorization of DOE Nuclear Facilities). The categories are assigned based on the following:

Index	Reference	Question/Comment	Answer
			- Hazard Category 1 has potential for significant offsite consequences, - Hazard Category 2 has potential for significant onsite consequences beyond localized consequences, - Hazard Category 3 has potential for only local significant consequences, and - Below Hazard Category 3 has potential for only consequences less than those that provide a basis for categorization as a Hazard Category 1, 2, or 3 nuclear facility.
93	Section H	What were the key changes introduced at the stage of nuclear facility design development or what changes are going to be introduced due to the wide-scale application of the BIM-approach in design development and construction?	The design, construction, and operation of nuclear facilities meet the requirements and procedures included in 10 CFR Part 830, DOE Order (O) 420.1C, DOE O 414.1D, DOE Policy 450.4A,205, and DOE Acquisition Regulation clauses at 48 CFR 970.5223-1, 48 CFR 970.5204-2, and 48 CFR 970.1100-1. The U.S. requires that nuclear facilities be designed to facilitate decontamination and a proposed decommissioning method must be included in the design.
94	Section H	Are there any information BIM-models or comprehensive digital twins of nuclear facilities involving digitally simulated NF operation processes (model of NF operational stage) and NF decommissioning concept (decommissioning concept model) in place or are these envisaged to be implemented at the design development and construction stage?	The U.S. does not prescribe the use of specific digital models of nuclear facilities for operational stage and decommissioning concept as long as the design, construction, and operation meet the requirements and procedures included in 10 CFR Part 830, DOE Order (O) 420.1C, DOE O 414.1D, DOE Policy 450.4A,205, and DOE Acquisition Regulation clauses at 48 CFR 970.5223-1, 48 CFR 970.5204-2, and 48 CFR 970.1100-1. However, the U.S. requires that nuclear facilities be designed to facilitate decontamination and a proposed decommissioning method must be included in the design.
95	Section H	Are there any plans on the development of a pan-European set of requirements and rules (standardized template) for the exchange of data on nuclear facility decommissioning designs?	No, the U.S. is not involved in developing a set of pan-European requirements and rules for exchanging decommissioning designs.

Index	Reference	Question/Comment	Answer
96	G.7, p. 113	The Report says that DOE has developed and has been running an R&D program on the long-term management of spent nuclear fuel. Could you please specify the contents of this R&D program? What are the preliminary findings of the R&Ds regarding the behavior of SNF under long-term storage conditions? If it's possible, please, provide some references to relevant open sources.	The Department of Energy (DOE) conducts research on long-term storage of spent fuel in canisters, including the performance of high-burnup fuel over long periods. This research includes testing cladding response with hydride reorientation and embrittlement; effects of atmospheric corrosion on strong welds; measuring the embrittlement of elastomer seals; determining thermomechanical degradation of bolts, welds, seals, and positions; analyzing thermal profiles of stored fuels; determining the stress profiles of fuels and casks; evaluating cask drying processes; laboratory post-irradiation examination of fuel; and development of sensors for internal and external cask monitoring. Information on some of these projects can be found at the following websites: https://www.energy.gov/ne/downloads/high-burnup-dry-storage-cask-research-and-development-project-final-test-plan; https://www.energy.gov/ne/downloads/high-burnup-spent-fuel-data-project-sister-rod-test-plan-overview; https://www.osti.gov/biblio/1568885-high-burnup-demonstration-thermal-modeling-tn-vacuum-drying-isfsi-transients; and https://www.osti.gov/biblio/1498450-analysis-gas-samples-taken-from-high-burnup-demonstration-cask. In addition, DOE also conducts ongoing research on various disposal geologic media including clay/shale, salt, and crystalline rock. Part of this work includes evaluating the feasibility of directly disposing of dual-purpose spent fuel canisters in mined geologic repositories. Information on this work may be found at the following websites: https://www.osti.gov/servlets/purl/1648777; https://www.osti.gov/biblio/1544664-direct-disposal-dual-purpose-canisters-lanl-boral-solubility-fy19; https://www.osti.gov/biblio/1616378-preliminary-analysis-postclosure-dpc-criticality-consequences; and https://info.ornl.gov/sites/publications/Files/Pub151495.pdf. DOE's research and development activities are also shared with universities, the Nuclear Regulatory Commission, the Nuclear Waste Technical Review Board, the Nuclear Energy Institute, the Electric Power Research Institute, and international agencies.
97	Section H	What exactly are the authorized limits set for waste disposal at solid waste landfills by DOE?	The authorized limits mentioned in Section H.3.1 in the U.S. Seventh National Report are established to ensure no special regulatory requirements beyond those already in place for the landfill are necessary. The Department of Energy (DOE) Manual 435.1-1, Radioactive Waste Management Manual, provides performance objectives for the disposal of low-level radioactive waste at DOE low-level waste disposal facilities. The Manual states that DOE low-level waste disposal facilities be sited, designed, operated,

Index	Reference	Question/Comment	Answer
			maintained, and closed so that a reasonable expectation exists that specific performance objectives and performance measures will be met for waste disposed at DOE facilities. The specific performance objectives related to authorized limits for waste disposal facilities include: (a) dose to a representative member of the public or maximally exposed individual shall not exceed 25 mrem (0.25 mSv) in a year total effective dose equivalent from all exposure pathways, excluding the dose from radon and its progeny in air; (b) dose to representative members of the public via the air pathway shall not exceed 10 mrem (0.10 mSv) in a year total effective dose equivalent, excluding the dose from radon and its progeny; (c) release of radon shall be less than an average flux of 20 pCi/m²/s (0.74 Bq/m²/s) at the surface of the disposal facility. Alternatively, for radon, a limit of 0.5 pCi/l (0.0185 Bq/l) of air may be applied at the boundary of the facility. Authorized limits of radionuclides may vary by site based upon exposure pathways but are based upon meeting the above dose constraints or other dose constraints under applicable Federal, State, and Tribal laws, regulations and agreements.
98	Section A	Are there any specific deadlines for the implementation of the HLW disposal program?	For the past 10 years, Congress has appropriated no funds to the Department of Energy (DOE) for a permanent disposal facility at Yucca Mountain or to the Nuclear Regulatory Commission (NRC) for the Yucca Mountain licensing proceeding. NRC's adjudicatory proceeding on the Yucca Mountain license application is currently suspended. There is no programmatic timetable for when spent fuel disposal capability will exist. In 2021, Congress appropriated funds to DOE for interim storage activities. Congress has recommended that DOE move forward under existing authority to identify potential sites for Federal interim storage facilities using a consent-based siting process. DOE does not have established deadlines for implementation of its high-level waste disposal program.
99	Section A	What is the planned schedule for the construction and commissioning of the Yucca Mountain Repository?	For the past 10 years, Congress has appropriated no funds to the Department of Energy for a permanent disposal facility at Yucca Mountain or to the Nuclear Regulatory Commission (NRC) for the Yucca Mountain licensing proceeding. NRC's adjudicatory proceeding on the Yucca Mountain license application is currently suspended. There is no programmatic timetable for when spent fuel disposal capability will exist.
100	Section B.3.2	It is mentioned on page 30 in the US NR that each Federal agency makes an independent decision with respect to NWPA assigned roles and responsibilities, and	A signed Memorandum of Understanding between the Department of Energy (DOE) and Nuclear Regulatory Commission (NRC) facilitates sharing technical expertise. DOE and NRC, as well as other Federal agencies, also have access to Max.gov, which provides a government-wide suite of advanced collaboration, information sharing, data collection,

Index	Reference	Question/Comment	Answer
		available information; however, the Federal agencies, consistent with the roles and responsibilities, are allowed to exchange information on the relevant issues to ensure each agency's views and potential concerns are understood. Could you please briefly describe mechanism for information exchange, its scope and frequency?	publishing, business intelligence, and authentication tools and services used to facilitate cross-government collaboration and knowledge management.
101	Section A	It is stated on page 1 of the US NR that the US has achieved progress in radioactive waste management, including issuing guidance and policy on Very Low-Level Waste (VLLW) disposal (Section A.3.2). Could you outline principal provisions of VLLW disposal guidance and policy?	As noted in the guidance document (which can be found at the Nuclear Regulatory Commission's [NRC's] Agency-wide Documents Access and Management System [ADAMS], under ML19295F109), NRC typically considers approval of alternative disposal requests (ADRs) for very low-level waste (VLLW) on a case-by-case basis. The term VLLW does not have a statutory or regulatory definition, but is described in the VLLW Scoping Study (which can be found at NRC's ADAMS, under ML21132A296) as material created during the conduct of licensed activities, which contains some residual radioactivity, including naturally occurring radionuclides, that may be safely disposed of in hazardous or municipal solid waste landfills. Although these materials could be disposed of in a low-level waste (LLW) disposal facility licensed under 10 CFR Part 61, the use of alternative disposal procedures under 10 CFR 20.2002 may reduce overall risk (e.g., risk associated with increased transportation distances and associated radiological and non-radiological impacts), and may preserve disposal capacity at LLW disposal facilities for higher risk waste streams, while also providing reasonable assurance of adequate protection of public health and safety and protection of the environment. Although 10 CFR 20.2002 does not specify a dose limit, NUREG-1757, Volume 1, references "a few mrem" per year (i.e., 0.05 mSv per year [5 mrem per year]) as one potential guideline for acceptable alternative disposals.
102	Section A.3.1	Could you give an update on the current status of Yucca Mountain Repository project?	For the past 10 years, Congress has appropriated no funds to the Department of Energy for a permanent disposal facility at Yucca Mountain or to the Nuclear Regulatory Commission (NRC) for the Yucca Mountain licensing proceeding. NRC's adjudicatory proceeding on the Yucca Mountain license application is currently suspended.

Index	Reference	Question/Comment	Answer
103	Section K.1.6.	Could you give examples of amendments in waste acceptance criteria for WIPP?	Examples include relatively minor updates, such as changes in organizational responsibilities, to more complex technical and procedural changes to ensure transuranic waste is managed in a manner that protects human health and safety and the environment. For example, several new activities and process enhancements were established in the waste acceptance criteria after the 2014 radiological release event, including requirements to conduct an enhanced chemical compatibility evaluation and preparation of a Basis of Knowledge document to specify when waste with oxidizing chemicals is acceptable as is, or when treatment will be required along with the treatment that must be performed. A more recent example is revising the waste acceptance criteria to allow receipt and processing of remote-handled waste when containerized in a shielded container. The current version of the Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant can be found at: https://wipp.energy.gov/documents-library-by-title.asp. Each revision to the document includes an upfront section summarizing the associated changes to the previous revision.
104	Section A	Are there any plans in the US to construct deep geological repositories for high-level waste?	The U.S. plans to meet its obligation to disposition spent fuel and high-level waste.
105	A.3.8, P19, para 3	According to the requirements from IAEA No.GSG-1Classification of Radioactive Waste, most of the GTCC LLW could be classified as intermediate-level Radwaste, and recommended to be disposed in a intermediate depth.In A.3.8,"In July 2019, NRC issued, for public comment, a draft regulatory basis evaluating the suitability of certain categories of GTCC LLW for near-surface disposal", please describe the definition of GTCC LLW and how to guarantee the long-term safety of disposal of the GTCC LLW.	Under its regulations in 10 CFR 61.55, the Nuclear Regulatory Commission (NRC) classifies low-level waste (LLW) into three classes, namely Class A, Class B, and Class C, based on the radiological hazard as determined by the concentration of radionuclides prescribed for each class. Class C is the most hazardous of the three categories, and LLW streams that contain radionuclide concentrations exceeding the limits for Class C waste are referred to as "greater-than-Class C" (GTCC) LLW. GTCC LLW may be generated by a variety of facilities both within and outside of the nuclear fuel cycle. Under NRC's current regulations, GTCC waste must be disposed of in a geologic repository unless "proposals for disposal of such waste in a disposal site . . . are approved by the Commission." However, to date, the Commission has not received or approved any such request. Based on our evaluation of the hazards and other considerations, NRC determined that most of the GTCC waste streams analyzed are potentially suitable for near-surface disposal.

Index	Reference	Question/Comment	Answer
106	A.3.2.2,P11, para 4	It's mentioned that in A.3.2.2 "NRC is conducting a scoping study to address VLLW management to identify whether the NRC should take actions to strengthen its regulatory framework for VLLW". Please give description on the regulatory requirements and some relevant management practices in the field of VLLW.	In 2018, the Nuclear Regulatory Commission (NRC) initiated the very low-level waste (VLLW) scoping study to identify potential options to improve and strengthen the regulatory framework for VLLW disposal. As part of this study, the staff sought stakeholder input, evaluated lessons learned from prior initiatives to address VLLW, reviewed domestic and international practices, and examined applicable literature and other information developed in the study. In addition, the staff considered VLLW initiatives in 2019 and 2020 that also generated relevant stakeholder feedback. Based on these activities, the staff evaluated NRC's regulation of VLLW and concluded that the current regulatory framework is robust, effective, provides adequate protection of public health and safety, and provides sufficient disposal options for waste generators. The VLLW scoping study was completed in 2021 and is available at NRC's Agency-wide Documents Access and Management System, under ML21132A296.
107	D.2.2.2,P44 , para 6	Refer to 10CFR61, the surveillance time for near-surface disposal facility should be 300 years. From the report, there are four closed commercial LLW sites in the U.S., and the longest surveillance time has reached almost 40 years. Please describe the surveillance and monitoring status of the closed near-surface disposal sites, including the monitoring of radwaste package, engineering barrier, as well as environmental monitoring.	In accordance with the Nuclear Regulatory Commission regulations at 10 CFR 61.53, after the disposal site is closed, the licensee responsible for post-operational surveillance of the disposal site shall maintain a monitoring system based on the site's operating history and the stabilization of the disposal site. The monitoring system must be capable of providing early warning of releases of radionuclides from the disposal site before they leave the site boundary. The specific requirements of the monitoring system, including the length of time it must be in place, are based on site-specific considerations. As an example, showing how this is done, the Beatty Low-Level Waste (LLW) disposal facility in Nevada ceased the acceptance of LLW in 1992 after 30 years of operation. In 1997, the radioactive material license was transferred to the State of Nevada, and the site entered the institutional control period. Nevada conducts quarterly radiation surveys and surveillance inspections of the closed facility. Each survey includes radiation measurements, documentation of erosion, water pooling, fissures and subsidence on the cover, and review of precipitation from a local weather station.
108	G.6,P113, para 1	Requirements for incident reporting are stipulated in 10 CFR 72.74, 72.75, and 72.80. It is required to report significant events where NRC may need to act to maintain or improve safety or to respond to public concerns. All events are considered against the International Nuclear Event	Level 2 or higher events on the International Nuclear Event Scale pertaining to spent fuel management did not occur in the U.S. during the period 2017-2019.

Index	Reference	Question/Comment	Answer
		Scale (INES). A report should be generated under INES requirements if the event is classified a Level 2 or above. Section F.12 provides additional information on facility operations. Events identified as potentially affecting operating experience are reported by licensees quarterly. Is there any Level 2 or above event in the field of spent fuel management happened during this period (2017-2019)? If any, please describe the events briefly.	
109	K.2.1, P146, para 3	In P146, " Agencies must communicate with the public and program stakeholders to assure them that subject matter experts have the experience and knowledge to safely and securely handle the spent fuel and HLW. DOE must provide the public with background information to help familiarize them with the spent fuel program and the safe management of the nuclear material. " Please describe requirements and programmes for selecting the public and stakeholders to be communicated.	Federal agencies, including the Department of Energy (DOE), routinely engage with State, Tribal, and local governments, conducting regular meetings and providing opportunities for comment and input while making every effort to conduct activities in an open and transparent manner. Correspondence with DOE and the public, as well as inspections, environmental analyses, and other reports, are available in the public record and published online. In addition, DOE regularly engages with community committees or advisory organizations to foster communication and information exchange between DOE and the members of the local community and local government officials. Actively engaging the interested local community and seeking their views and concerns on the management and disposition of spent fuel and high-level waste enables DOE to better identify and consider local viewpoints and keep communities informed of such activities. See Section F.7.8 in the U.S. Seventh National Report.
110	A.3.1.3 P9 para 2	P9: "CISFs are facilities proposed for the interim storage of spent fuel and reactor-related GTCC LLW prior to final disposal in a	A consolidated interim storage facility (CISF) could be co-located at a power reactor site, but to date, no applicants have proposed a CISF to be co-located with a power reactor. Under the Nuclear Regulatory Commission (NRC) regulations, licensees may store spent fuel in dry cask storage systems at independent spent fuel storage installations (ISFSIs) at

Index	Reference	Question/Comment	Answer
		deep geologic disposal facility. The CISFs would be similar to existing Independent Spent Fuel Storage Installations (ISFSIs), providing dry storage of spent fuel with integrated shielding structures. CISFs will be regulated under Title 10 of the Code of Federal Regulations (10 CFR) Part 72, and as proposed, would not be co-located with a power reactor."Why would CISFs not be co-located with a power reactor as proposed? Besides the location, what are the differences between the Consolidated Interim Storage Facility (CISF) and the Independent Spent Fuel Storage Installation (ISFSI)?	a reactor site or at an away-from-reactor site (see https://www.nrc.gov/waste/spent-fuel-storage.html). NRC received two applications for CISFs. NRC issued a Materials License to Interim Storage Partners, LLC to construct and operate the WCS CISF in Andrews County, Texas, after NRC completed its safety, environmental, and security reviews in September 2021. A summary of the WCS CISF licensing actions can be found at NRC's Agency-wide Documents Access and Management System, under ML21188A096. The second CISF application was submitted in March 2017 by Holtec International for its proposed HI-STORE CISF in Lea County, New Mexico, and it is still under NRC review. A summary of the Holtec International CISF licensing actions can be found at: https://www.nrc.gov/waste/spent-fuel-storage/cis/holtec-international.html. At this time, neither Interim Storage Partners, LLC nor Holtec International has proposed the co-location of a CISF at a specific power reactor site. Therefore, both the WCS CISF and the proposed Holtec CISF are considered "away-from-reactor" ISFSIs. Additional information on the CISFs can be found at: https://www.nrc.gov/waste/spent-fuel-storage/cis.html. CISFs and ISFSIs are subject to NRC's regulations in 10 CFR Part 72, Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste, (which can be found at: https://www.nrc.gov/reading-rm/doc-collections/cfr/part072/index.html).
111	K.2.3,P149, para 2	P149: "DOE is responsible for cleaning up 107 sites across the U.S., most of which resulted from defense activities. To date, DOE has made substantial progress in nearly every area of nuclear waste cleanup and completed cleanup at 91 of these sites. …" For the last 16 legacy sites, what are the main difficulties and challenges for the cleanup? What measures will be taken? And what is the timetable of the cleanup of the last 16 legacy sites?	The remaining 16 legacy sites face a few common challenges such as working with aging infrastructure, incorporating new project management capabilities and requirements, improving assessment and reporting capabilities, and incorporating increased flexibility in work locations, while maintaining readiness. Three of the larger sites also have challenges related to remediating/closing large underground waste tanks, vitrifying, and disposing residual tank waste, as well as managing and dispositioning spent fuel. The Department of Energy (DOE) currently estimates the cleanup of the final site to be complete in 2070-2075 timeframe. Some scheduled milestones may be revised due to work interruptions caused by COVID-19. DOE will continue to work with regulators to revise milestones, as needed. The DOE Office of Environmental Management Strategic Vision: 2021–2031 discusses

Index	Reference	Question/Comment	Answer
			the challenges at the different sites and can be found at https://www.energy.gov/em/em-strategic-vision-2021-2031.
112	A3.1.2, P8, last Para.	It is stated that "In November 2019, EPRI convened a workshop……associated with spent fuel dry cask storage systems. The topic of discussion was identification of potential concerns associated with extended dry storage of spent fuel……" Please give more details on the workshop, e.g. what are the potential concerns identified by the workshop, and what measures will be taken in the future?	The Extended Storage Collaboration Program (ESCP), sponsored by the Electric Power Research Institute (EPRI), is a group of individuals, government agencies, national laboratories, and individuals that work with spent fuel. The meetings/conferences are held twice a year. A report, Extended Storage Collaboration Program (ESCP): Nondestructive Evaluation Subcommittee – Industry Progress Report (October 2017), can be found at: https://www.epri.com/research/products/000000003002010617. Although the Department of Energy (DOE) and its national laboratories participate in the meetings, DOE is not a sponsor and does not provide any funding for any of the ESCP activities. After the meetings, EPRI provides all the presentations that were made at the conference to all registrants for the conference for future reference. No document is provided by EPRI that tries to summarize or make overall observations about the meetings. With the presentations, individual registrants can study the data and information presented and make their own conclusions on the data that is presented.
113	B.5, P33, Para. 2	It is stated that "U.S. Governmental agencies work closely with industry, stakeholders, and members of the public to ensure lessons learned from decommissioning are appropriately factored into the next generation of nuclear facilities (e.g., NPPs, uranium mill facilities, and enrichment facilities)." Please give more details on the lessons learned from decommissioning, e.g. what lessons have been learned from decommissioning? What measurements have been taken to ensure lessons learned from decommissioning are appropriately factored into the	The Nuclear Regulatory Commission (NRC) has summarized lessons learned from decommissioning in Regulatory Guide 4.21, Minimization of Contamination and Radioactive Waste Generation (which can be found at NRC's Agency-wide Documents Access and Management System under ML080500187). Appendix A of this guide, "Examples of Measures to Control Contamination," describes specific lessons learned from previous decommissioning activities. NRC anticipates that applicants will rely on Regulatory Guide 4.21, or other acceptable approaches, when preparing license applications. For example, nuclear facilities generally incorporate leak or spill collection systems to protect against leakage.

Index	Reference	Question/Comment	Answer
		next generation of nuclear facilities? And what specific lessons have been factored into the next generation of nuclear facilities?	
114	F.2.3.1,P73, Para. 1	It is stated that "The surety requirements ensure that sufficient funds are available for the site operator to conduct all required site closure and stabilization activities and for the site owner to establish and maintain legally durable institutional controls after license termination." How long is it for the site operator to conduct all required site closure and stabilization activities usually? What are the contents of the institutional controls established by the site owner?And how much is the estimated cost for the site owner to establish and maintain legally durable institutional controls after license termination?	Currently, all disposal facilities are licensed by Agreement States as discussed in Section D.2.2.2. in the U.S. Seventh National Report. The site closure and stabilization activities of these disposal facilities take as long as necessary to implement the closure design, which is site-specific, but should be as short as practical. Following completion of the closure, the licensee shall observe, monitor, and carry out necessary maintenance and repairs at the disposal site until the license is transferred by the Commission. The licensee generally maintains responsibility for five years to ensure closure and stabilization were successful, though a shorter or longer period may be approved. Institutional controls are active or passive barriers or actions to limit access to the disposal site following transfer of control of the disposal site from the disposal site operator. The types of active controls generally applied include fencing, electronic surveillance, and active or periodic patrols or inspections. The types of passive controls include deed restrictions or other management controls to limit inadvertent transfer and use of the site, and placement of warning markers to indicate potential danger from use of the site. The institutional control program can include actions such as carrying out an environmental monitoring program at the disposal site, periodic surveillance, minor custodial care, other requirements as determined by the Commission, and administration of funds to cover the costs for these activities. The period of institutional controls will be determined by the Nuclear Regulatory Commission (NRC), but institutional controls may not be relied upon for more than 100 years following transfer of control of the disposal site to the owner. NRC requirements at 10 CFR 61.63 states “Prior to the issuance of the license, the applicant shall provide for Commission review and approval a copy of a binding arrangement, such as a lease, between the applicant and the disposal site owner that ensures that sufficient funds will be available to cover the costs of monitoring and any required maintenance during the institutional control period. The binding arrangement will be reviewed periodically by the Commission to ensure that changes in inflation, technology, and disposal facility operations are reflected in the arrangements.”

Index	Reference	Question/Comment	Answer
			To date, NRC has never licensed a low-level waste disposal facility because, at this time, these facilities are under Agreement State authority. For this reason, Agreement States, rather than NRC, have approved the binding agreements between a licensee and site owner and the site-specific cost estimates. At the license application phase, a licensee must develop estimates that reflect the site-specific costs of monitoring for releases and performing required maintenance at facilities during the institutional control period. These site-specific cost estimates and the financial assurance that the funds will be available are provided by the licensee at the license application stage and must be approved and periodically reviewed by the regulator, which may be NRC or an Agreement State (See NUREG-1200, Revision 3, Standard Review Plan for the review of a license application for a Low-Level Radioactive Waste Disposal Facility. These activities include but are not limited to: (1) periodic repair or replacement of fencing, (2) maintenance or replacement of surveillance equipment, and (3) collection of monitoring samples and analysis of the results.
115	J.2,P135,Para. 1	It is stated that the disposal of two 137Cs source capsules with a combined activity of 563 Ci (20.8 TBq) was successfully completed in September 2017. Please give more details on the 137Cs source conditioning process before it was disposed, the specification of the capsules and the acceptance criteria (including the activity limit) for disposal facility.	The sources were not removed from the device (Gammacell 1000), which is a robust device that once met previous Type B container testing requirements. For disposal, the device was placed into an engineered concrete barrier and secured in place using concrete. The disposal facility was able to dispose of radioactive waste up to the Nuclear Regulatory Commission's Class C limit as defined by 10 CFR 61.55.
116	K.2,P145,Para. 1	It is stated that "As a result, continued storage of spent fuel at the reactor ISFSIs will be necessary for longer time periods than originally expected, due to delays in the availability of a repository for permanent disposal." Will the extension of interim storage time lead to an	For the past 10 years, Congress has appropriated no funds to the Department of Energy (DOE) for a permanent disposal facility at Yucca Mountain or to the Nuclear Regulatory Commission (NRC) for the Yucca Mountain licensing proceeding. NRC's adjudicatory proceeding on the Yucca Mountain license application is currently suspended. There is no definitive schedule for the disposal of spent fuel. Spent fuel will continue to be safely stored until a disposal facility is available. Technical understanding and experience continue to support the technical feasibility of safe storage of spent fuel in spent fuel pools and in dry casks, based on their physical

Index	Reference	Question/Comment	Answer
		additional burden to the future generation? What is the consideration of the timetable of the R&D of final disposal option? Please give more details on the program of the siting, construction and operation of the repository including milestones and time schedule. Please introduce the current practice and experience of dry storage of high burn-up spent fuel and damaged spent fuel in the United States. How to consider economy of dry storage and the safety on the long-term dry storage of spent fuel (more than 40 years). Please introduce considerations on the monitoring of performance indicators and main evaluation criteria for the expected life extension of dry storage facility during the design and construction. Please introduce how to consider the reasonable configuration of dry storage and wet storage facilities when planning storage of spent fuel.	integrity over long periods of time. NRC considers the specific fuel characteristics of fuel to be stored in an independent spent fuel storage installation (ISFSI) (e.g., high burnup fuel) and, when applicable, the operational procedures for handling damaged fuel in determining whether its safety requirements are met. NRC regulations for dry cask storage allow for a licensing period of up to 40 years for both initial and renewed licenses. These storage times are sufficiently short and the degradation rates of spent fuel sufficiently slow that: (1) significant storage, handling, and transportation issues are not expected to arise during a single license period; and (2) should information collected during the license period identify any emerging issues and concerns, there would be sufficient time to develop regulatory solutions. NRC requires that the collection of appropriate information and the implementation of aging management activities are part of license renewals. These include: (1) time-limited aging analyses that demonstrate the structures, systems, and components (SSCs) important to safety continue to perform their intended functions; and (2) aging management programs for specific issues known to be associated with aging, which could adversely affect SSCs important to safety. NRC will continue to provide oversight of safe storage of commercial spent fuel until a repository is available for final disposal. NRC licensees are responsible for meeting NRC's safety requirements for storage of spent fuel and maintaining safety. Although the costs for continued storage represent a continued cost, the eventual disposal of spent fuel and high-level waste remains the current approach in the U.S. DOE is the agency responsible for siting, constructing, and operating a disposal facility in compliance with NRC's regulatory safety requirements. NRC continues to believe that 25 to 35 years is a reasonable period for repository development (i.e., candidate site selection and characterization, final site selection, licensing review, and initial construction for acceptance of waste). However, the time needed to develop a repository site will depend upon a variety of factors, including Congressional action and funding. Public acceptance will also influence the time it will take to implement geologic disposal. DOE anticipates that a Federal consolidated interim storage facility would need to operate for at least 60 years. This is based on the time needed to identify a site for a disposal facility through a consent-based siting process, license and construct the disposal facility, and move spent fuel to the disposal facility. However, the timeline for interim storage would need to be negotiated with a potential host community through the consent-based siting process and be agreed to as part of the consent agreement.

Index	Reference	Question/Comment	Answer
117	E.2.3.5 (P.66)	The Nuclear Waste Technical Review Board, is described in E2.3.5, as an organization that performs an independent and integrated technical evaluations. What are their major/recent activities including actual numbers and outputs?	The Nuclear Waste Technical Review Board (Board) was established by the Nuclear Waste Policy Amendments Act of 1987 to evaluate the technical and scientific validity of activities undertaken by the Department of Energy (DOE) including: (1) site characterization activities; and (2) activities relating to the packaging or transportation of high-level waste or spent fuel. In the course of the Board's ongoing review of DOE activities related to managing spent fuel and high-level waste, the Board conducts document reviews, holds fact-finding meetings with DOE, holds public meetings, and conducts other work necessary to fulfill its mission. During calendar years 2020 and 2021, the Board conducted five public meetings, published four reports that were transmitted to the Secretary of Energy and the Congress, and issued seven letters to DOE. Details about the Board's public meetings, reports, and letters to DOE can be found at https://www.nwtrb.gov/.
118	P.90	US major radiation protection standards for gaseous and liquid effluent release concentrations are indicated in Table F-3. Please provide information on the following: 1) Are there total annual discharge limits, that are only distinguishable between liquid and gas in Bq, set for radioactive wastes generated from nuclear facilities, i.e. NPPs, reprocessing facilities, etc.? If there are, do the total annual discharge limits for liquid and gas, consist of nuclides specific or groups of nuclides specific limits? Also, what are, the set limits per nuclides/groups of nuclides especially for tritium, as well as the basis for those set limits? For examples, discharge limits are set based on, expected annual release calculated from	The Nuclear Regulatory Commission (NRC) regulations at 10 CFR Part 20 establish annual discharge limits based primarily on calculated radiation dose to members of the public. NRC does not regulate effluents based on total release quantities of radionuclides. In addition to the 10 CFR Part 20 regulations, nuclear power plants are required by 10 CFR 50.36(a) to include Technical Specifications (TS). The TS establish criteria for the control of radioactive effluents operating procedures for the radioactive waste system sufficient to keep average annual releases of radioactive material in effluents and doses at small percentages of the public dose limits. Appendix I of 10 CFR Part 50 establishes the basis for the design of radwaste systems and is the basis for the operating criteria to meet the "As Low as is Reasonably Achievable" criteria of TS. Regulatory Guide 1.21, Measuring, Evaluating, and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste, provides guidance to licensees on acceptable methods of meeting NRC regulations for radioactive effluent discharges, which can be found at NRC's Agency-wide Documents Access and Management System, under ML21139A224.

Index	Reference	Question/Comment	Answer
		actual discharge amounts of previous years, calculation assuming upper limit of 1mSv over a year for each nuclides, committed effective dose received by the public of 1mSv over 70 years, etc. If there are discharge target values, recommended by a regulatory body for nuclear facilities licensees to be achieved, which are lower than the set limits, please provide the basis for the target values.	
119	P.90	2) Are there nuclides specific or groups of nuclides specific concentration limits set for each gas and liquid discharges into the environment? What are those discharge concentration limits and the basis for the set concentration limits, especially for tritium? For examples, discharge concentration limits are set based on, expected annual release calculated from actual discharge amounts of previous years, calculation assuming upper limit of 1mSv over a year for each nuclides, committed effective dose received by the public of 1mSv over 70 years, etc. If there are discharge target concentration values recommended by a regulatory body for nuclear	Appendix B of 10 CFR Part 20, "Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage," establishes annual average effluent concentration limits for each radionuclide (https://www.nrc.gov/reading-rm/doc-collections/cfr/part020/part020-appb.html). The regulations pertain to the current year of effluent release. Licensees are required by Technical Specifications (TS) to perform cumulative totals based on monthly discharges to ensure the annual limits are not exceeded. The concentration values in Column 1 (for air concentrations) and Column 2 (for water concentrations) of Table 2 in Appendix B are equivalent to a radionuclide concentration which, if inhaled or ingested continuously over the course of a year, would produce a total effective dose equivalent of 0.05 rem (50 mrem or 0.5 mSv). The information on tritium can be found at: https://www.nrc.gov/reading-rm/doc-collections/cfr/part020/appb/hydrogen-3.html.

Index	Reference	Question/Comment	Answer
		facilities licensees to be achieved, which are lower than the set concentration limits, please provide the basis for the target concentration values.	
120	P.90	3) Also, please provide the actual amounts of each gaseous and liquid radioactive wastes released or discharged annually into the environment from nuclear facilities between 2016 and 2020, especially, for annual discharge amounts of tritium and other nuclides in forms of gas and liquid, per types of nuclear facilities (NPPs with reactor types, reprocessing facilities, others) 4)For an evaluation of exposure dose from tritium, if other than the radiological concentration factor of 1 is used for the evaluation, please provide the used radiological concentration factor and the basis for its use.	The Nuclear Regulatory Commission (NRC) regulations at 10 CFR 50.36a require each nuclear power plant to submit an annual radiological effluent release report. These reports can be found at: https://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-info.html. In addition, NRC summarizes the radioactive effluent release reports and publishes the information in NUREG/CR-2907, *Radioactive Effluents from Nuclear Power Plants*, which can be found at NRC's Agency-wide Documents Access and Management System, under ML21266A422. The NRC does not use a tritium reconcentration factor.
121	P.90	Is there a concept of generalized clearance threshold for gas and liquid waste from nuclear facilities ?	The Nuclear Regulatory Commission does allow the use of a calculated dispersion factor in air and in liquid effluents to the location of the nearest public receptor. Specifically, 10 CFR 20.2001(a) provides that licensees may dispose of licensed material by release in effluents within the limits of 10 CFR 20.1301.
122	Section A.3.1.1.	U.S. Report indicates that the President's Fiscal Year 2021 budget requests appropriations from the Nuclear Waste Fund (NWF) that would prioritize the development and implementation of an interim storage program for	In 2021, Congress appropriated $20 million to the Department of Energy (DOE) for interim storage activities. Based on Congressional recommendations and appropriations, DOE will move forward under existing authority to identify potential sites for Federal interim storage facilities using a consent-based siting process. Holtec International and Interim Storage Partners, LLC are funding their proposed facilities, with no funding from the Federal government.

Index	Reference	Question/Comment	Answer
		nuclear waste. Has the amount needed for an interim storage program development and implementation been evaluated, and would that appropriation from the Nuclear Waste Fund jeopardise the funding of a future permanent disposal facilty? Will the NWF be used to fund facilities such as the ones under design by Interim Storage Partners and Holtec International?	
123	Section F.3.2	U.S. Report indicates DOE programs must develop their QA programs by applying 10 QA criteria using a graded approach. Do activities regulated by NRC also apply the equivalent of the 10 QA program using a graded approach? If so, what are the related criteria?	The Nuclear Regulatory Commission's (NRC's) requirements for quality assurance (QA) programs are different from those of the Department of Energy (DOE) because NRC is solely a regulator and does not operate any facilities itself. NRC's QA requirements are summarized in Section F.3.1 in the U.S. Seventh National Report for various types of regulated facilities. While some of NRC's QA requirements are similar to the QA criteria in DOE Order 414.1D, Chg 2, Quality Assurance, other NRC requirements are tailored to the type of facility. NRC employs a graded approach to QA using risk information. This allows an applicant to justify its QA approach based on the proposed activities, considering the complexity and uniqueness of the facility. NRC reviews and approves the proposed approach if it meets the applicable requirements. As an example, compare the QA requirements for a low-level waste (LLW) disposal facility in 10 CFR 61.12(j) with the QA requirements for spent fuel storage in 10 CFR 72.140-144 and 10 CFR 72.174. The requirements for spent fuel storage are much more detailed and prescriptive compared to the requirements for an LLW disposal facility, based on the expected risk characteristics of these facilities.
124	Section D.2.1	U.S. Report indicates the Waste Treatment and Immobilization Plant, that will be used to treat defense waste from reprocessing,	The Department of Energy is currently scheduled to begin processing low activity tank waste at the Hanford Site in the near future using the Direct-Feed Low-Activity Waste (DFLAW) Program, which is an approach that sends certain pretreated low-activity waste from the tank farms directly to the Waste Treatment and Immobilization Plant (WTP)

Index	Reference	Question/Comment	Answer
		will be designed to operate for 40 years. When is the facility scheduled to operate? Could safety concerns associated to the "large underground tanks" storing the reprocessed waste arise if the Waste Treatment and Immobilization Plant commissioning was delayed?	Low-Activity Waste (LAW) Vitrification Facility for vitrification. At Hanford, there are 177 underground tanks storing approximately 56 million gallons of radioactive liquid. Tanks are continuously monitored to ensure that none are currently leaking. Monitoring occurs both in-tank, by measuring volume, and in the surrounding soil using moisture and radiation detectors.
125	-	Does the U.S. have a national strategy to prioritize the management of spent fuel storages (in particular wet storages) and of GTCC-LLW and HLW awaiting to be transfered to disposal ?	In 2021, Congress appropriated funds to the Department of Energy (DOE) for interim storage activities and recommended that DOE move forward under existing authority to identify potential sites for Federal interim storage facilities using a consent-based siting process. This would support near-term action in managing the nation's spent fuel and is an important component of an integrated waste management system. In December 2021, DOE issued a request for information (RFI) on a consent-based siting process that would be used to identify sites to store the nation's spent fuel, and responses were due by March 4, 2022. The information received from responses to the RFI will be used to develop DOE's consent-based siting process and overall waste management strategy. DOE is committed to the consent-based siting approach that makes communities and people central in the process to give the nation its best chance at success in solving the nation's decades-long stalemate over how to effectively manage its spent fuel. DOE is currently formulating a comprehensive strategy to develop a sustainable, integrated system capable of transporting, storing, and disposing of spent fuel and high-level waste from civilian nuclear power generation. Under the Nuclear Regulatory Commission (NRC) regulations, licensees may store spent fuel in dry cask storage systems at independent spent fuel storage installations (ISFSIs) at a reactor site or away-from-reactor site (see https://www.nrc.gov/waste/spent-fuel-storage.html). A Consolidated Interim Storage Facility (CISF) is an ISFSI for purposes of NRC regulations. CISFs are subject to the ISFSI requirements in NRC regulations in 10 CFR Part 72, Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste, (which can be found at: https://www.nrc.gov/reading-rm/doc-

Index	Reference	Question/Comment	Answer
			collections/cfr/part072/index.html). See the Answer to Question 110 regarding the status of the two CISFs applications the NRC received.
126	Section E.2.1.1	U.S. Report indicates standards need to be met prior to NRC's termination of a license regarding uranium recovery processes. What are the radiological and chemical criteria used terminate a license for uranium recovery processes?	The Nuclear Regulatory Commission (NRC) regulations in 10 CFR Part 40, Appendix A, "Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material From Ores Processed Primarily for Their Source Material Content," contains the radiological and chemical standards for decommissioning of uranium recovery facilities. This appendix establishes technical, financial, ownership, and long-term site surveillance criteria relating to the siting, operation, decontamination, decommissioning, and reclamation of mills and tailings or waste systems and sites at where such mills and systems are located.
127	Section D.3.4	U.S. Report indicates since 1980, 60 radiologically-contaminated sites have been placed on the National Priorities List (NPL) which currently counts 1335 sites over 1760 listed. Has the National Priorities List been updated since 1980? Which criteria where used to define the NPL and have they been updated?	The National Priorities List (NPL) is usually updated at least annually to add newly-identified sites and to remove sites that have been remediated according to the Record of Decision or sites where further investigation has shown that the release poses no significant threat to public health or the environment and remedial action is not appropriate. The Environmental Protection Agency (EPA) listed the first 406 sites in 1983. There are currently 51 sites proposed for addition to the NPL. Most recently, EPA added four sites to the NPL (86 FR 50478, September 9, 2021) and proposed to add a further 13 sites, while withdrawing one previously proposed site (86 FR 50515, September 9, 2021). The public has an opportunity to comment on proposed listings before they become final. A site may be listed on the NPL in three ways: (1) the site scores 28.5 or higher on the Hazard Ranking System (HRS). HRS is a screening tool that evaluates potential hazards to human health or the environment through groundwater, surface water, soil exposure, subsurface intrusion, and air pathways; (2) each state may designate a site as its top priority for listing on the NPL, without an HRS score; and (3) a site may be listed without an HRS score if all of the following conditions are met: (a) the Agency for Toxic Substances and Disease Registry of the U.S. Public Health Service has issued a health advisory that recommends dissociation of individuals from the site; (b) EPA determines that the release poses a significant threat to public health; and (c) EPA anticipates that it will be more cost-effective to respond to the release using its remedial authority rather than its removal authority. More information on the NPL can be found at: https://www.epa.gov/superfund/superfund-national-priorities-list-npl.

Index	Reference	Question/Comment	Answer
128	-	U.S. report does not mention entombment strategy. Is entombment of nuclear facilities (i.e. in-situ decommissioning) still an option for some legacy facilities and if any, which nuclear facilities are concerned?	As part of the ongoing decommissioning transition rulemaking, the Nuclear Regulatory Commission (NRC) staff was asked to evaluate the appropriateness of maintaining entombment as an option. As noted in the Regulatory Basis Document (which can be found at NRC's Agency-wide Documents Access and Management System, under ML17215A010), NRC staff position is that entombment should be used as a last resort for the decommissioning of power reactor facilities, with the expectation that this method would be selected only under unique decommissioning circumstances. One of the Rulemaking Options considered would remove ENTOMB as a decommissioning strategy in updates of the existing guidance because it is not feasible for U.S. nuclear power reactors and is not consistent with the required timeframe to complete decommissioning. The removal of the ENTOMB option is consistent with previous discussions between NRC, internal and external stakeholders, and members of the international regulatory community. In general, while all these parties recognize entombment, they also recognize that its application is limited to special situations; thus, it may not be appropriate to maintain it as a prescribed strategy within the typical regulatory framework.
129	Section D, Article 12, p.120	The report provides information that VLLW may be disposed of in industrial waste or hazardous waste landfills, provided that the landfills have established criteria for the acceptability of such waste and that the established exposure limits are not exceeded. Please specify the established acceptance criteria for the disposal of VLLW at one of the industrial waste landfills that receive VLLW.	There are no specific acceptance criteria for the disposal of very low-level waste at industrial landfills. Each request is considered on a case-by-case basis using 10 CFR 20.2002 and associated guidance. As outlined in NUREG-1757, Volume 1, doses of a few mrem per year (i.e., commonly interpreted by the Nuclear Regulatory Commission [NRC] as less than 0.05 mSv per year [5 mrem per year]) are used as a starting point but additional factors, including characteristics of the material, proposed disposal process, expected exposure pathways, and current and future land use scenarios are also considered. Approval of specific disposal actions may also be subject to other Federal and State regulations (e.g., waste acceptance criteria) associated with the disposal facility that fall outside the regulatory boundaries of NRC.
130	Section F.4.2.2, p.81	Please explain Figure F-1 as to why both collective and individual average doses (up to 5-fold) were reduced from 1996 to 1997.	Occupational standards in the U.S. are protective of workers; however, the U.S. continues to evaluate international standards and guidance as they evolve and will continue to consider their appropriateness for U.S. programs. For example, the Department of Energy (DOE) has adopted many concepts from the International Commission on Radiological Protection (ICRP) 60 in occupational worker safety

Index	Reference	Question/Comment	Answer
			requirements and into its Radiation Protection of the Public and the Environment directive, DOE Order 458.1, Chg 4. ICRP 60 recommends an occupational dose limit of 20 mSv per year, averaged over a defined 5-year period. It also states the dose should not exceed 50 mSv for any one year. DOE has not adopted the 5-year averaging requirement. As a result of stringently applied ALARA (as low as reasonably achievable) practices at DOE sites, occupational exposures to individuals at DOE sites have been consistently below both the 20 mSv per year average and the 50 mSv per year limit. Adoption of the 20 mSv per year average would require implementation of new dosimetry tracking systems without increasing worker safety.
131	Sections D, K, Annex D-2A, p. 42-43, 143,174,178	In clauses D.2.2.1, K.1.6 of the Report (p. 42 and p. 143, respectively), it is indicated that as of January 31, 2020, about 7 × 10 4 m3 of transuranic radioactive waste is placed in WIPP. At the same time, according to Table D-3 (p. 43) and Annex D-2A (p. 174), the inventory of transuranic radioactive waste is 9.81 × 10 4 m 3. Annex D-2A (p.174) states that the inventory of transuranic RW disposed at WIPP is given as of July 7, 2020. The above information shows that from January 31 to July 7, 2020, 2.81×104 m3 of transuranic RW were received at WIPP. Please explain whether this is correct and what is the reason for such volumes of transuranic RW accepted for disposal.	The 7E+04 cubic meters estimate is based on the current methodology used to calculate volume of record of defense transuranic (TRU) waste disposed of at the Waste Isolation Pilot Plant (WIPP). The WIPP Land Withdrawal Act (LWA) currently limits the volume of TRU waste disposed of at WIPP to approximately 1.76E+05 cubic meters (6.2E+06 cubic feet). In reporting emplaced volumes against the WIPP LWA limit, the Department of Energy only counts the volume of the inner container against the WIPP LWA limit to exclude air space found in certain waste packages (overpacked containers). The 9.81E+04 cubic meters (3.6E+04 cubic feet) estimate includes the outer package volume for waste that is placed in an overpack container. This volume is used for tracking waste emplacement under the WIPP regulatory permit. Both estimates are tracked by DOE, and updated values can be found at: https://www.wipp.energy.gov/WDSPA.

Index	Reference	Question/Comment	Answer
132	Section H	Please provide data on the dynamics of the activity of the generated radioactive waste.	Appendix A of the Annual Transuranic Waste Inventory Report (ATWIR) contains specific waste profile activities (https://wipp.energy.gov/library/TRUwaste/ATWIR-2021_CBFO_Final.pdf). In addition, the Waste Data System (WDS)/WIPP Waste Information System (WWIS) is a publicly accessible web site with activity data (https://www.wipp.energy.gov/WDSPA).
133	G3, page 110	Are public hearings held before the selection of a site for a new dry spent nuclear fuel storage facility? Who is responsible for holding them?	Upon receipt and acceptance of an application for a new specific license for a spent fuel storage facility, the Nuclear Regulatory Commission (NRC) provides a notice of an opportunity to request a hearing, or if the Commission determines that a hearing is in the public interest, a notice of hearing. Hearings are conducted in accordance with the Rules of Practice and Procedure in 10 CFR Part 2 of NRC's regulations (which can be found at: https://www.nrc.gov/reading-rm/doc-collections/cfr/part002/index.html). Administrative judges from NRC's Atomic Safety and Licensing Board Panel (ASLBP) generally conduct these hearings. On rare occasions, the Commission itself may preside at a licensing hearing. The ASLBP's judges are employees of NRC with technical or legal expertise, although the Administrative Procedure Act and NRC's ethics rules require that judges act independently from NRC staff. The administrative judges reach objective decisions based on the record and are prohibited from having financial or personal interests in the outcome of a proceeding. As discussed in Section A.3.1.3 of the U.S. Seventh National Report, NRC issued notices of docketing of the applications and informed the public of the opportunity to file a written request for a hearing on the license applications for new consolidated interim storage facilities. NRC received intervention petitions and established Licensing Boards to rule on the hearing requests for both proceedings. In both proceedings, the Licensing Boards heard oral arguments from hearing petitioners and reviewed their petitions to intervene. In both proceedings, the Licensing Boards determined that none of the hearing petitioners proffered an admissible contention and denied their hearing petitions. These Licensing Boards' decisions were appealed to the Commission, which ultimately upheld the Licensing Boards' initial decisions in both proceedings. Several of the hearing petitioners have appealed the Commission decision to various U.S. Court of Appeals, where they remain pending. Outside of the adjudicatory context, members of the public are afforded multiple opportunities to participate in the licensing process for a Consolidated Interim Storage Facility. During the environmental review, members of the public are invited to provide comments to inform NRC's environmental impact

Index	Reference	Question/Comment	Answer
			statement. Members of the public may also provide comments during public meetings open to the public regarding NRC 's safety review.
134	A 3.1.1, page 8	When is it planned to commission the Yucca Mountain Repository? What kinds of justification documents are needed to be submitted to the regulatory body by the licensee?	For the past 10 years, Congress has appropriated no funds to the Department of Energy (DOE) for a permanent disposal facility at Yucca Mountain or to the Nuclear Regulatory Commission (NRC) for the Yucca Mountain licensing proceeding. NRC's adjudicatory proceeding on the Yucca Mountain license application is currently suspended. In January 2015, NRC staff completed its safety evaluation report containing its findings on whether the proposed repository at Yucca Mountain would meets NRC regulations. In May 2016, NRC completed the supplement to DOE's Environmental Impact Statement. Completion of the safety evaluation report does not represent an agency decision on whether to authorize construction. A final licensing decision, should sufficient funds be appropriated, could come only after adjudicatory hearings on the numerous admitted contentions and the Commission's review.
135	p.29	Storage of spent fuel be initially licensed for up to 40 years with possible renewals of up to 40 years, with no restriction on the number of renewals. With aged materials the risk of uncertainties will grow. Do you take it into account in the renewal process and how?	As described in Section G.2 in the U.S. Seventh National Report, the Nuclear Regulatory Commission's (NRC's) typical review of an application for renewal of a spent fuel storage system evaluates degradation mechanisms and aging effects that may cause a reduction in the efficacy of storage system structures, systems, and components (SSCs). NRC requirements for spent fuel storage renewal include demonstration that aging and degradation will be addressed by either: (1) time-limited aging analyses that demonstrate that the SSCs continue to perform their intended functions, or (2) aging management programs (AMPs) to manage issues associated with aging, which could adversely affect SSCs. The renewal process provides for technical and scientific information and operational data to be considered in the decision of whether to approve the spent fuel storage renewal. The renewal process also provides a framework for integrating feedback from spent fuel storage operating experience, research and development, monitoring, inspections, and technological advances into the management of aging-related degradation for storage facility and system SSCs. The Institute of Nuclear Power Operation (INPO) established the aging management INPO database (AMID) to collect and share operating experience on aging effects on spent fuel storage systems and facilities for use by storage licensees and storage system vendors. NRC's renewal review ensures that AMPs include provisions for licensees to use the AMID and to conduct future periodic reviews of the aggregated operating experience to confirm the effectiveness of the AMPs or update the AMPs as necessary, to address any lessons

Index	Reference	Question/Comment	Answer
			learned identified during the review of operating experience. The AMID and the periodic assessments of the aggregated operating experience are considered key elements in ensuring the effectiveness of aging management activities and the continued safe storage of spent fuel during the renewal period. NRC's current guidance on spent fuel storage renewals is contained in NUREG-1927, Rev. 1, Standard Review Plan for Renewal of Specific Licenses and Certificates of Compliance for Dry Storage of Spent Nuclear Fuel (which can be found at: https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1927/r1). Additionally, NUREG-2214, Managing Aging Processes in Storage (MAPS) Report (which can be found at https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr2214/), provides technical guidance on aging mechanisms and AMPs that are considered generically acceptable to address aging effects so that the design bases of storage facilities and systems will be maintained. Also, Regulatory Guide 3.76, Implementation of Aging Management Requirements for Spent Fuel Storage Renewals (which can be found at NRC's Agency-wide Documents Access and Management System [ADAMS], under ML21098A022) provides guidance on the format and content of storage renewal applications and the implementation of AMPs, and endorses, with clarifications, industry guidance in Nuclear Energy Institute NEI 14-03, Revision 2, Format, Content and Implementation Guidance for Dry Cask Storage Operations-Based Aging Management (which can be found at NRC's ADAMS, under ML16356A204).
136	p. 144	The introduction and usage of the process Acceptable Knowledge seems to be a powerful tool to characterize waste streams. Please provide more information about your experiences and problems like information gaps or uncertainties? Is this method associated with increased staffing?	In response to the 2014 Waste Isolation Pilot Plant (WIPP) Incidents, the Carlsbad Field Office (CBFO) established additional checks on waste contents including increased oversight both by CBFO staff and indirectly through the Central Characterization Project (CCP). DOE established the CCP to standardize and provide efficiencies in the characterization and certification process at DOE transuranic waste generator sites. CBFO maintains frequent communication with generator Field Offices and their respective facility staff and has established reporting expectations regarding the completeness of generator-site information. The primary basis for waste characterization is a process known as Acceptable Knowledge (AK) – the documentation of all known information on how a transuranic (TRU) waste stream was created and managed, and that information is then compiled and documented. Methods of AK waste characterization may include: - Radiological characterization using non-destructive assay or dose-to-curie methods.

Index	Reference	Question/Comment	Answer
			- Visual confirmation of items using real-time radiography or visual examination methods. - Flammable gas analysis to meet transportation requirements. AK is subject to CCP quality assurance assessments and potential visibility from the Generator Site Technical Reviews. Even with these checks, completeness and thoroughness of AK relies on generator site reporting. To substantially increase AK assurances, it would require proportional cost and at least some increase in time to do so. Calendar year 2022 finds the National TRU Program Certification Division with ever smaller waste-stream container populations and evermore complex waste-stream histories than ever before: the "easier" legacy-waste is already in the Waste Isolation Pilot Plant (WIPP). By using multiple experts to review documentation from one particular waste-stream AK, the review time may be shortened, but with exponential increases in staff, cost, and inefficiency. The most efficient waste-stream AK reviews are from beginning to end by one person, or, by multiple people each working from beginning to end in parallel. This comprehensive review by an individual is most efficient but takes more time. These are the keys to AK assurances: cost and time. An enhanced AK process has been implemented to meet new waste acceptance criteria requirements and includes chemical compatibility evaluations and a basis of knowledge document to ensure appropriate measures are taken to prevent hazard-characteristic wastes such as ignitable waste.
137	General	*[Contracting Party]* would like to commend USA for a most comprehensive and informative report.	Thank you for the complimentary comment on the U.S. Seventh National Report.
138	p. 15	A.3.6 Waste Disposition for Commercial Medical Isotope Production: "DOE is responsible for planning and carrying out programs for establishing a uranium lease and take-back (ULTB) program associated with 99Mo production. As directed by	The Department of Energy (DOE) National Nuclear Security Administration (NNSA) and Office of Environmental Management (EM) have signed the first contracts as part of DOE's Uranium Lease and Take-back Program (ULTB) with SHINE Technologies, LLC. This is a milestone in DOE's effort to increase domestic production of molybdenum-99, a crucial medical isotope used in over 40,000 medical procedures in the U.S. each day, without the use of highly enriched uranium. NNSA's lease contract will provide SHINE with the low-enriched uranium necessary to

Index	Reference	Question/Comment	Answer
		AMIPA, DOE established the 99Mo ULTB program in January 2016". Could USA please elaborate on the success of the Uranium Lease and Take-Back Program?	produce molybdenum-99. DOE EM's contract with SHINE details the requirements to return any resulting radioactive waste to DOE that cannot be disposed of commercially once molybdenum-99 production is complete. Over the years, other potential producers have reached out to DOE seeking information regarding ULTB arrangement. As these potential producers move forward, DOE will continue to provide necessary support and guidance
139	General	How, if at all, do the activities and future plans described in the US National Report align with the United Nations 17 Goals on Sustainable Development?	The U.S. Seventh National Report satisfies the requirements of the Joint Convention for reporting on U.S. policies and practices used to ensure safety of spent fuel and radioactive waste management. The Joint Convention focuses on the back end of the nuclear fuel cycle. On the other hand, the United Nations 17 Goals on Sustainable Development is more appropriately linked with nuclear electric power generation or its distribution, which is more aligned with the Convention on Nuclear Safety. In contrast to the Joint Convention, the Goals on Sustainable Development are focused on eliminating hunger, improving health, providing access to affordable and clean energy, generating decent work and economic growth, and mobilizing climate action.
140	D.1.2 (p.38)	In section D.1.2, it is stated that the adjudication on the application to construct a geological repository at Yucca Mountain is suspended. What are the implications of this suspension in the planning and schedule for the final disposal?	For the past 10 years, Congress has appropriated no funds to the Department of Energy for a permanent disposal facility at Yucca Mountain or to the Nuclear Regulatory Commission (NRC) for the Yucca Mountain licensing proceeding. NRC's adjudicatory proceeding on the Yucca Mountain license application is currently suspended. A final licensing decision, should sufficient funds be appropriated, on whether to authorize construction could come only after hearings on the numerous admitted contentions raised in the adjudication. There is no programmatic timetable for when spent fuel disposal capability will exist.
141	A.3.1.3 (p.9)	The report indicates that in March 2017, Holtec International submitted an application to NRC for a specific license to construct and operate the HI-STORE CISF, to be located in Lea County, New Mexico. NRC anticipates completing its safety, security, and environmental reviews in 2021. Can you give more details on the construction schedule?	The Nuclear Regulatory Commission (NRC) review of the HI-STORE Consolidated Interim Storage Facility (CISF) is not yet complete. The details on the construction schedule for the HI-STORE CISF are not yet available. If NRC issues the specific license to construct and operate the HI-STORE CISF, the licensee would be authorized to begin construction of the proposed facility as long as it complies with the conditions of the license. The licensee is also responsible for pre-construction activities, including obtaining applicable permits from other Federal and State agencies. Once the licensee has obtained all required permits, it may begin construction of the facility. The licensee is responsible for the business and logistical decisions that would affect the initiation of construction. Therefore, the specifics of the construction schedule would be finalized by the licensee, if NRC grants a license.

Index	Reference	Question/Comment	Answer
			After a licensee commences construction of the facility, NRC will provide oversight of construction activities to ensure that it meets regulatory requirements and the terms of its license. Upon completion of the construction phase, NRC will provide oversight of operations, including during the loading and unloading of spent fuel.
142	A.3.1.4 (p.10)	The US Department of Energy (DOE) has published a new interpretation of high-level radioactive waste (HLW). Can you provide some more information on how this new interpretation is going to impact on the safety criteria? To which extent have the factors related to human health and safety risks been evaluated?	Under the Department of Energy's (DOE's) high-level waste (HLW) interpretation, certain reprocessing waste proposed for disposal as non-HLW must meet the performance objectives of the disposal facility, among other requirements, for protection of human health and the environment (e.g., 10 CFR Part 61, Subpart C; Chapter 4, Paragraph P of DOE Manual 435.1-1, Radioactive Waste Management Manual). Human health and safety risks are evaluated as part of the disposal process for each individual waste stream. DOE will continue to use the existing framework of guidelines, best practices, regulations (e.g., 10 CFR Part 61), and other mechanisms to ensure that each waste stream—whether from reprocessing or other sources—is properly characterized before it is received by the proposed disposal facility. DOE follows established practices to characterize and document radioactive waste in sufficient detail to ensure safe management and compliance with the waste acceptance requirements of any facility receiving the waste. For example, for the first waste stream evaluated under the HLW interpretation (Savannah River Site Recycle Wastewater), the National Environmental Policy Act Analysis and technical evaluation can be found at: https://www.energy.gov/em/downloads/technical-evaluation-non-high-level-radioactive-waste-non-hlw-determination-under-hlw and https://www.energy.gov/nepa/doeea-2115-commercial-disposal-defense-waste-processing-facility-recycle-wastewater-savannah.
143	D.2.2.1 (p.42)	WIPP is a geological repository used to safely and permanently dispose TRU waste generated by atomic energy defense activities. It is stated that over 7.0E+04 m3 TRU waste was emplaced as of January 31, 2020. Can you provide	Under the Waste Isolation Pilot Plant (WIPP) Land Withdrawal Act, the total capacity of WIPP is limited by volume to approximately 1.76E+05 cubic meters (6.2E+06 cubic feet) of defense transuranic waste.

Index	Reference	Question/Comment	Answer
		more information on the maximum capacity of WIPP?	
144	F.2 (p.71)	Both NRC-regulated and DOE facilities have requirements to ensure human and financial resources are sustained for spent fuel and radioactive waste management activities. It can be noted that compared with the previous reporting, the FTE distribution per activity has significantly decreased. 0 FTE has been allocated for 'high level waste repository' activities. Could you elaborate on how US ensures that experience is preserved for future activities in this area?	The Nuclear Regulatory Commission (NRC) continues to support knowledge management activities that preserve key information and experience associated with NRC's regulatory programs. In particular, NRC and its contractor (the Center for Nuclear Waste Regulatory Analyses) have completed a number of knowledge management reports capturing technical and regulatory topics associated with NRC's repository program. Such documentation will assist NRC in its support of future activities in the high-level waste disposal program. The allocation of 0 full-time equivalent for high-level waste repository activities reflects the status of NRC's licensing process that is currently suspended. The Department of Energy is actively conducting knowledge management work to preserve information and experiences from personnel and past projects related to the waste management system. These activities include historical summary reports, document databases, interviews, and staff workshops.
145	Sections A.3.1.3, F.7.3, K.1.3	How many and which locations are being considered for consolidation of spent fuel and at what point are final decisions made about possible locations? With more than one location, how would decisions of what goes where be made (e.g., to the closest location)? Also, it appears that consolidation would occur at potential sites with existing waste facilities, is this correct?	As discussed in Section A.3.1.3 of the U.S. Seventh National Report, currently two locations are being considered for storage of spent fuel and reactor-related greater-than-Class C (GTCC) radioactive waste at a consolidated interim storage facility (CISF). See the Answer to Question 110 regarding the status of the two CISF applications the Nuclear Regulatory Commission (NRC) received. Each applicant for a license to store spent fuel makes its own decision about requesting a license to build and operate a facility. Thus, each separate license application from Interim Storage Partners, LLC and Holtec International requested a specific licensed capacity for spent fuel. The CISFs, when licensed and constructed, could accept spent fuel from any nuclear plant as long as the spent fuel meets the specifications in the CISF licensing basis. Each CISF licensee is responsible for the business and logistical decisions related to movement of spent fuel from the originating nuclear plant site to its CISF site. NRC would provide licensing and oversight, consistent with its statutory authorities, to ensure the safe and secure transport of spent fuel to a licensed CISF, and the operation of the licensed CISF. These oversight activities would include appropriate inspections during loading and unloading operations, during transportation, as well as periodic inspections of the storage facility. However, NRC has no regulatory role beyond its

Index	Reference	Question/Comment	Answer
			safety and security functions in determining the originating location of spent fuel shipments to a CISF. It is correct that the licensed WCS CISF in Andrews County, Texas, is located near the existing WCS low-level waste disposal facility site. However, the proposed HI-STORE CISF is not co-located with any licensed or existing waste disposal facility.
146	Section A.3.7.3	It appears that many NPPs are following active decommissioning under accelerated schedules. How many NPPs have selected to be in extended periods of inactivity (i.e., SAFSTOR)?	As of September 30, 2021, a total of 10 power reactors were in SAFSTOR, as described in SECY-21-0100, Status of the Decommissioning Program 2021 Annual Report, Enclosure 1 (which can be found at NRC's Agency-wide Documents Access and Management System, under ML21280A402).
147	Sections D.3.1, H.2.5, H.4.5	Does DOE's Office of Legacy Management include the administration of land use restrictions (e.g., limiting drilling activities, land use management, etc.) in addition to the activities listed in Section D.3.1? Does DOE manage all such sites across the US, including ones in Agreement States or EPA Authorized States?	The Department of Energy (DOE) Office of Legacy Management is often referred to as a third-party beneficiary in the administration of land-use restrictions. Normally, the land-use restrictions are administered by agencies within affected states and tribes. The mission of the Office of Legacy Management is to fulfill DOE's post-closure responsibilities and ensure the future protection of human health and the environment. This includes managing sites formerly cleaned up under Agreement State regulation. Under long-term surveillance and maintenance, the Nuclear Regulatory Commission provides oversight.
148	Sections E.2.2.1, F.7.8, K.1.6	With respect to the WIPP event in 2014, did the releases associated with the event lead to any issues related to public acceptance with the continued operation of the site and if there are issues, how are they mitigated?	The local community has remained supportive of Waste Isolation Pilot Plant (WIPP) operations. Rigorous communication strategies were undertaken in the weeks and months that followed the February 2014 event and helped to rebuild public trust and confidence. These strategies included weekly town hall meetings and updates; a WIPP Recovery website; special workshops for community leaders and other stakeholders; and creation of a "Nuclear Task Force" with community leaders to better understand the recovery actions and responses being performed at WIPP. These Nuclear Task Force meetings were beneficial to both the community and the Department of Energy (DOE) to better understand concerns and deliver information. In the seven years since the 2014 event, DOE has continued to maintain open and transparent communications with the public on WIPP operations, including communicating actions taken to prevent recurrence of similar events.

Index	Reference	Question/Comment	Answer
149	Sections E.2.2.2, F.2, F.7.6, G.7, K.1.1, K.2.1	How do the continued delays in disposal of commercial spent fuel (i.e., Yucca Mountain) affect the long-term strategy and the success for an eventual disposal facility for this type of waste in the US, including considerations for knowledge management? And, are there any special considerations/impacts related to transportation?	The Department of Energy is actively conducting knowledge management work to preserve information and experiences from personnel and past projects related to the waste management system. These activities include historical summary reports, document databases, interviews, and staff workshops. The Nuclear Regulatory Commission (NRC) also continues to support knowledge management activities that preserve key information and experience associated with NRC's regulatory programs. In particular, NRC and its contractor (Center for Nuclear Waste Regulatory Analyses) have completed a number of knowledge management reports capturing technical and regulatory topics associated with NRC's repository program. Such documentation will assist NRC in its support of future activities in the high-level waste disposal program. Transportation is not within the scope of the Joint Convention.
150	Section K.2.3	Did the event noted in Section K.2.3 (re tunnel roof collapse) create public concerns with legacy wastes at the Hanford site?	The Department of Energy has extensive communications with the public, stakeholders, and Tribal Nations regarding the cleanup of the Hanford Site. While we have not noted any lingering concerns resulting from the incident, we have assessed lessons learned and identified best practices on communicating with the public in such instances.
151	A.3.2.1/ p.11	Provide details of Alternative Disposal Request. Why generic commercial facilities and disposal at the WIPP are considered as alternative disposal facilities?	The details of alternative disposal requests can be found in our guidance document which is available at the Nuclear Regulatory Commission's Agency-wide Documents Access and Management System, under ML19295F109. Any disposal in a non-10 CFR Part 61 or Agreement State licensed disposal facility is considered an alternative disposal. The Waste Isolation Pilot Plant (WIPP) has specific legal limitations on what it can accept, and it is not considered to be an alternative disposal facility. WIPP accepts for permanent disposal defense-generated transuranic and transuranic mixed waste in conformance with the WIPP Land Withdrawal Act.
152	Table A-3/ p.20	Despite of the declared long term policy to dispose SF and HLW in a geologic repository, this facility is not considered as a future facility in the matrix. Why?	There is no programmatic timetable for when spent fuel and high-level waste disposal capability will exist, and therefore, such a facility is not included in the matrix.
153	E.2.2/p.59	What is the reason for giving the oversight over WIPP to EPA and not NRC in WIPP LWA?	Congress structured the Waste Isolation Pilot Plant (WIPP) Land Withdrawal Act to provide the Environmental Protection Agency with regulatory authority over certain aspects of the operation of WIPP, including, in partnership with the State of New

Index	Reference	Question/Comment	Answer
			Mexico, regulatory oversight of the disposal of any hazardous waste components in radioactive waste streams. The WIPP Land Withdrawal Act did not provide for Nuclear Regulatory Commission regulatory oversight.
154	F.2.3.2/	Are there any utilities generating HLW and/or SF not having a contract with DOE for their disposal? If yes, how will they manage (technically and financially) disposal of their HLW and/or SF.	No. The Nuclear Waste Policy Act of 1982, as amended (NWPA), requires commercial nuclear reactor owners to enter into, or engage in active and good faith negotiations for, contracts with the Department of Energy for the disposal of their spent fuel and high-level waste. All U.S. utilities that generate or possess spent fuel and high-level waste from civilian nuclear power reactors have contracts with the Federal government for disposal.
155	p.73	Do you perform any emergency tests? If yes, how often?	Section F. 5, "Emergency Preparedness," in the U.S. Seventh National Report describes the extensive emergency preparedness and emergency management programs in place at U.S. facilities. The Nuclear Regulatory Commission (NRC) regulations require that comprehensive emergency plans be prepared and periodically exercised to ensure actions are taken, among other things, to notify and protect citizens in the vicinity of a spent fuel storage facility during an emergency. For example, NRC regulation at 10 CFR 72.32 states, "12) Exercises. (i) Provisions for conducting semiannual communications checks with offsite response organizations and biennial onsite exercises to test response to simulated emergencies. Radiological/Health Physics, Medical, and Fire drills shall be conducted annually. Semiannual communications checks with offsite response organizations must include the check and update of all necessary telephone numbers. The licensee shall invite offsite response organizations to participate in the biennial exercise…(ii) Participation of offsite response organizations in biennial exercises, although recommended, is not required. Exercises must use scenarios not known to most exercise participants. The licensee shall critique each exercise using individuals not having direct implementation responsibility for conducting the exercise. Critiques of exercises must evaluate the appropriateness of the plan, emergency procedures, facilities, equipment, training of personnel, and overall effectiveness of the response. Deficiencies found by the critiques must be corrected." In the Department of Energy, emergency preparedness activities encompass drills and tests (see Section F.5.2 in the U.S. Seventh National Report).
156	F.5/ p.87	NRC conducts approximately 900 inspections per year. How many inspectors do work at NRC?	The Nuclear Regulatory Commission has approximately 30 inspectors who conduct a variety of inspections of nuclear material licensee fuel cycle facilities and radioactive materials activities and operations, including the management of radioactive waste and discharge of radioactive effluents. The specific types of inspectors include fuel facilities

Index	Reference	Question/Comment	Answer
			inspectors, physical security inspectors, health physicist inspectors, spent fuel storage inspectors, emergency preparedness inspectors, and transportation and storage safety inspectors.
157	F.12.1.1/ p.105	Do R&D projects consider disposal of SF in storage canisters or casks, without the need of SF re-packing? If yes, provide a general overview of such a project.	The Department of Energy (DOE) conducts ongoing research considering disposal of spent fuel in canisters and waste packages in various geologic media including clay/shale, salt, and crystalline rock. Part of this work evaluates the feasibility of direct disposal of commercial light water reactor spent fuel in dual purpose canisters. Information on this work can be found at: https://www.osti.gov/servlets/purl/1648777; https://www.osti.gov/biblio/1544664-direct-disposal-dual-purpose-canisters-lanl-boral-solubility-fy19; https://www.osti.gov/biblio/1616378-preliminary-analysis-postclosure-dpc-criticality-consequences; and https://info.ornl.gov/sites/publications/Files/Pub151495.pdf. In addition to commercial spent fuel, DOE manages spent fuel from a wide variety of reactors with different cladding and enrichment. DOE has overseen the design of two types of canisters capable of storage, transportation, and disposal of DOE-managed spent fuel as part of a larger system: the Multi-Canister Overpack (MCO) and the DOE Standard Canister. Over 400 MCOs have been loaded at one of DOE's nuclear sites. Additional information on the design, loading, and sealing process can be found at: https://www.osti.gov/biblio/1194007-drop-testing-representative-multi-canister-overpacks and https://www.osti.gov/biblio/823763-design-hanford-multi-canister-overpack-mco-development-qualification-closure-welding-process. To help package the additional DOE-managed spent fuel, DOE is funding the development of a DOE Spent Fuel Packaging Demonstration Project to develop and demonstrate the designs, technologies, processes, and regulatory framework for packaging DOE-managed spent fuel in the DOE Standard Canister. The project is supplemented by many structural, criticality, and material compatibility evaluations that supported disposal of the DOE Standard Canister for the Yucca Mountain Repository license application. Some of these evaluations can be found at: https://www.osti.gov/biblio/911076-drop-testing-doe-spent-nuclear-fuel-canisters; https://www.osti.gov/biblio/1515019-neutron-absorber-considerations-doe-standardized-canister; and https://www.osti.gov/biblio/911533-packaging-strategies-criticality-safety-other-doe-fuels-repository.

Index	Reference	Question/Comment	Answer
			Many of these evaluations are expected to be valid in any deep geological repository, but new assessments or evaluations would need to be performed to confirm these assumptions. Currently, DOE Spent Fuel Packaging Demonstration is focusing on the loading process: handling, welding, inspection, weld repair, conditioning, leak testing, and stress mitigation/protection. Current plans are to start with two distinct uranium-thorium graphite fuel types that can be co-loaded into the DOE Standard Canister. To demonstrate the capability of long-term storage, the packaging demonstration includes encasing multiple DOE Standard Canisters in an over-canister, which maintains the same function as a multi-purpose canister for commercial spent fuel. The over-canister would then be stored on an aging pad as part of a commercial storage system (overpack, module). An overview of this project can be found at: https://www.osti.gov/biblio/1833632-project-execution-plan-environmental-management-spent-nuclear-fuel-technology-development.
158	G.7/p.113	Existing storage systems are being evaluated for longer time than originally considered. Do you license the casks for longer storage time that they were originally designed?	No, the Nuclear Regulatory Commission (NRC) does not allow the use of a spent fuel storage cask system beyond the period for which it was originally designed. As discussed in B.3.1 in the U.S. Seventh National Report, cask storage systems can be initially certified for up to 40 years of use with renewal periods of up to 40 years. NRC does not restrict the number of renewals but considers the appropriateness of each renewal request in a technical and safety review. The 40-year licensing period does not necessarily equate to a design life for a specific system. An applicant seeking approval of a spent fuel storage system must demonstrate the safety of the storage system design, including materials performance, for the requested license term. Renewal of licensing periods includes evaluation of degradation mechanisms and aging effects that may cause a reduction in the efficacy of storage system structures, systems, and components (SSCs). NRC's requirements for renewal of a spent fuel storage system include demonstration that aging and degradation will be addressed by either: (1) time-limited aging analyses that demonstrate that the SSCs continue to perform their intended functions for the requested renewal period, or (2) aging management programs to manage issues associated with aging, which could adversely affect SSCs during the requested renewal period.
159	G.7/ p.113	Can you describe how do you determine 'near the surface	As stated in Section H.3.2, "Controlling Solid Materials Disposition," in the U.S. Seventh National Report, the release of solid material is addressed on a case-by-case basis using license conditions and regulatory guidance. In general, if the radiological contamination

Index	Reference	Question/Comment	Answer
		contamination' and 'volume contamination'?	is present on the surface of an object in such a manner that direct radiological surveys, including both wipe samples and measurements using radiation detectors, can be used to reliably measure the areal quantity of fixed and removable radionuclides present, then the contamination is deemed to be on or near the surface.
160	H.3.2/ p.121	The report states that the U.S. has taken steps forward to address the challenge of safely managing spent fuel and radioactive waste. Please provide details on further development of Yucca Mountain Repository and an update on the decision schedule, if available.	For the past 10 years, Congress has appropriated no funds to the Department of Energy for a permanent disposal facility at Yucca Mountain or to the Nuclear Regulatory Commission (NRC) for the Yucca Mountain licensing proceeding. NRC's adjudicatory proceeding on the Yucca Mountain license application is currently suspended. There is no programmatic timetable for when spent fuel and high-level waste disposal capability will exist.