UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
TYLER DIVISION

STATE OF TEXAS; STATE OF UTAH; STATE OF LOUISIANA; STATE OF FLORIDA; ARIZONA STATE LEGISLATURE, BY AND THROUGH PRESIDENT OF THE ARIZONA SENATE WARREN PETERSEN AND SPEAKER OF THE ARIZONA HOUSE OF REPRESENTATIVES STEVE MONTENEGRO; LAST ENERGY, INC.; DEEP FISSION, INC.; and VALAR ATOMICS INC.;

Plaintiffs,

No. 6:24-cv-00507

v.

UNITED STATES NUCLEAR REGULATORY COMMISSION,

Defendant.

FIRST AMENDED COMPLAINT FOR DECLARATORY RELIEF AND VACATUR UNDER THE ADMINISTRATIVE PROCEDURE ACT

INTRODUCTION

1. Advanced nuclear technology is critical to securing affordable, reliable, and safe power, including for Texas and its citizens. To this end, Governor Greg Abbott recently directed the Public Utility Commission of Texas ("PUCT") to create a working group to promote the development of advanced nuclear technology and make Texas a "national

leader in using advanced nuclear energy." Letter from Governor Greg Abbott to Kathleen Jackson, Interim Chair, PUCT (Aug. 16, 2023), https://perma.cc/5TU2-7UXE.

2. In particular, small modular reactors ("SMRs"), which are typically designed to be "both safe and less financially risky than large nuclear power plants," could "'dramatically expand nuclear power in the state of Texas'" and "create reliable power without also pumping pollution into the air." Emily Foxhall, *Small Nuclear Reactors May be Coming to Texas, Boosted by Interest from Gov. Abbott*, Tex. Trib. (Mar. 27, 2024), https://perma.cc/LC3M-9JG6.

3. Some SMRs can generate up to 300 megawatts (electrical) of power, which is about half the output of smaller conventional nuclear power plants, but the SMRs at issue in this case are much smaller—e.g., in the range of about 20 megawatts (electrical) or smaller, meaning they generate just a small fraction of the power of a conventional nuclear power plant and, due to safety features, would release close to zero radiation even in the worst reasonable scenario like a meltdown. *See infra* ¶¶ 113–153.

4. Such SMRs and their even-smaller counterparts (called "microreactors") typically have numerous advantages compared to traditional nuclear reactors, including lower cost, greater siting flexibility, and faster construction, portending a revolution in nuclear power that has the potential to generate clean, safe, and reliable power for the nation and the world.

5. SMRs of this type are also particularly well-suited to provide power generation in important industrial applications. For example, SMRs are highly desirable

power sources for hydraulic fracturing operations in the Permian Basin in Texas because SMRs can provide a large amount of electricity with a small footprint in remote locations, while also helping alleviate demand on the state's ever-growing electric grid.

6. Utah's Governor likewise recently announced "Operation Gigawatt," an initiative to double Utah's power production during the next decade in response to the looming energy crisis. *See, e.g.*, Governor of Utah, Spencer J. Cox, News Release, *Gov. Cox Unveils 'Operation Gigawatt'* (Oct. 8, 2024), https://perma.cc/EMM3-EQAR?type=image. A key component of this crucial plan requires enhancing policies to enable clean, reliable energy sources like nuclear. *Operation Gigawatt: Powering Utah's Energy Future*, Utah Off. of Energy Dev., https://perma.cc/2F5N-JWS7 (last visited Dec. 30, 2024).

7. Louisiana has similarly recognized that advanced nuclear technologies—including SMRs and microreactors—are necessary to supply the "clean, plentiful and reliable" power needed to support the data centers, reshored manufacturing, and other industries anticipated to drive economic growth in the state. *Louisiana Is Positioning Itself to Power the Southern Renaissance*, Real Clear Energy (Sept. 5, 2024), https://www.realclearenergy.org/articles/2024/09/05/louisiana_is_positioning_itself_to_power_the_southern_renaissance_1056302.html. The Governor of Louisiana has thus ordered the Louisiana Department of Environmental Quality to implement procedures to "support and advance innovative measures to resolve environmental hazards" in preparation for the expansion of nuclear energy generation within the state. La. Gov. Exec. Order No. JML 24-166 (Nov. 4, 2022), https://perma.cc/U7AB-9VPE.

8. Florida is also actively exploring the use of advanced nuclear technology to meet its rapidly growing energy needs. In a March 2025 assessment, conducted at the direction of the Florida Legislature and Governor, Florida's Public Service Commission concluded that while the state could benefit from advanced nuclear power technology to meet its long-term energy needs, "[l]icensing and construct[ing]" a "nuclear power plant[] [is a] long-lead project[]" with increased financial risk and risk of delay. Fla. Pub. Serv. Comm'n, *Advanced Nuclear Power Feasibility Report* 63 (Mar. 31, 2025), https://perma.cc/2MZE-2M4L.

9. The Arizona State Legislature has also concluded that advanced nuclear technologies are key to meeting anticipated growth in electricity demand and has introduced legislation that would streamline the installation of SMRs in large industrial facilities. *See* Jerod MacDonald-Evoy, *Data Centers In Rural Arizona Could Build Nuclear Reactors Under GOP Proposal*, TucsonSentinel.com (Feb. 21, 2025), https://perma.cc/K276-BQA7. As Arizona's House Majority Leader has observed: "Small modular reactors are a game-changer. They offer the ability to repurpose existing facilities, attract new industry, and provide clean, reliable, and affordable power to rapidly-expanding industries that are critical to national defense, like data centers." Majority Leader Michael Carbone, Press Release, *Arizona Advanced Legislation To Streamline Permitting For Small Modular Reactors Co-Located With Data Centers* (Feb. 20, 2025), https://perma.cc/A578-BNHP.

10. Plaintiff Last Energy, Inc. has invested tens of millions of dollars in developing the technology for small nuclear reactors, including $2 million on

manufacturing efforts in Texas alone. Last Energy's entire nuclear system operates inside of a container that is fully sealed with twelve-inch-thick steel walls, and as such, has no credible mode of radioactive release even in the worst reasonable scenario.

11. As of 2024, Last Energy has agreements to develop over 50 nuclear reactor facilities across Europe, which would produce power worth tens of billions of dollars over their lifetime. James Durston, *Micro Nuclear Power: Interview with Bret Kugelmass, CEO of Last Energy*, Blue Tech Wave (Feb. 1, 2024), https://btw.media/company-stories/micro-nuclear-power-interview-with-bret-kugelmass-ceo-of-last-energy/. One such project in the United Kingdom would lead to nearly $400 million dollars in local investment contributing to the South Wales economy. *See US Startup Last Energy Plans Micro Nuclear Project in Wales*, Reuters (Oct. 15, 2024), https://www.reuters.com/sustainability/climate-energy/us-startup-last-energy-plans-micro-nuclear-project-wales-2024-10-14/.

12. With a preference to build in the United States, Last Energy nonetheless has concluded it is only feasible to develop its projects abroad in order to access alternative regulatory frameworks that incorporate a *de minimis* standard for nuclear power permitting, limiting requirements with a consideration of proportionality to the risk embodied in the technology. That conclusion notwithstanding, Last Energy has worked with Texas to take concrete steps to deploy its technology to power the State's growing data center industry in the event that the U.S. regulatory framework changes. *See infra* ¶¶ 219–224.

13. Plaintiff Deep Fission, Inc. was incorporated in 2023 to build small reactors with safety and energy affordability in mind, resulting in the development of a reactor that

can be placed one mile underground and deliver 15 megawatts (electrical) of power to the surface. Deep Fission's scalable modular technology allows bespoke configurations to meet the diverse needs of end-users in large cities, or military bases or to power hyper-scale data centers and utilities. The safety of Deep Fission's reactors derives not only from their placement deep underground, but also from the natural containment provided by the rock and earth surrounding the borehole in which the reactor resides, which further protects the public from harmful levels of radiation.

14. To date, the company has spent millions of dollars expanding its engineering department and licensing team to complete its reactor design and concurrently engage with the U.S. Nuclear Regulatory Commission ("NRC"), in hopes of obtaining a combined operating license by 2029. Once ground is broken at a customer site, Deep Fission's underground reactors could be operational within six months. Deep Fission is actively pursuing opportunities to locate reactors in Texas and Utah.

15. As a result of the lengthy licensing timeline and challenges of engaging in a process that wasn't designed for small reactors or deep borehole technology, Deep Fission has pursued customers and partners outside the United States, including in the United Kingdom, Europe, the Middle East, and southeast Asia, where the company's technology can be implemented on a commercially viable timeline that fits customer demand. But like Last Energy, Deep Fission's preference is to build in the United States, where it can contribute substantially to the nation's energy portfolio at a time when meeting electricity

demand is crucial not only for the stability and prosperity of communities in Texas and other states, but also for ensuring U.S. national security interests.

16. Valar Atomics is a nuclear energy startup focused on developing small High Temperature Gas Reactors ("HTGRs") using helium. Founded in 2023, Valar Atomics is working to build a 100 kilowatt (thermal) demonstration test reactor—with no power conversion—to demonstrate the feasibility of its core design and helium transport architecture. Eventually, Valar Atomics plans to develop a commercial reactor at a power rating of less than 50 megawatts (electrical) using HTGR passive safety principles, low power density, and robust nuclear fuel. These commercial reactors will be deployed on remote sites away from population centers and will be used to supply heavy industrial power on private grids and produce clean hydrogen.

17. Although Valar Atomics is committed to pursuing development within the United States, the hurdles presented by the NRC's regulatory framework have compelled Valar Atomics to launch its initial reactor projects overseas, resulting in the loss of potential jobs, technological advancement, and economic benefits in Texas, Utah, and other states.

18. As explained in more detail below, Congress long ago made clear that it intended for the United States to use the same risk analysis now used abroad for nuclear power projects—one that focuses on technology-specific risk scenarios and exempts smaller, safe reactors that do not use significant amounts of nuclear material from federal licensing requirements.

19. But building a new commercial reactor of any size in the United States has become virtually impossible—indeed, only three new commercial reactors have been built in the United States in the last 28 years. *Nuclear Reactors in the United States of America*, World Nuclear Ass'n (last visited Oct. 31, 2024), https://perma.cc/8LTE-HH9X.

20. The root cause is not lack of demand or technology—but rather the NRC, which so restrictively regulates new nuclear reactor construction that it rarely happens at all. Despite the promise of advanced nuclear technology to improve safety and reliability, and despite numerous laws designed to encourage SMR innovation, the NRC's misreading of its own scope of authority has become a virtually insuperable obstacle. As explained further below, however, this is not the regime Congress created.

21. The NRC imposes complicated, costly, and time-intensive requirements that even the smallest and safest SMRs and microreactors—down to those not strong enough to power an LED lightbulb—must satisfy to acquire and maintain a construction and operating license. These requirements threaten the health and prosperity of residents of Texas and other states by hindering the rollout of safe and reliable power—precisely the sort of thing that Last Energy, Deep Fission, and Valar could provide. The NRC's licensing requirements also impose financial costs on entities with *existing* NRC operating licenses, including Plaintiffs Texas, Utah, and Florida. Two leading Texas universities (University of Texas at Austin and Texas A&M), the University of Utah, and the University of Florida (collectively, "the Universities")—house research and test reactors, requiring them to expend significant costs to maintain their NRC operating licenses. NRC, *Backgrounder:*

Research and Test Reactors (May 2020) (Accession No. ML040280402), [1] https://www.nrc.gov/docs/ML0402/ML040280402.pdf; *Non-Power Production or Utilization Facility License Renewal*, 89 Fed. Reg. 106,234 (Dec. 30, 2024).

22. Unfortunately, the NRC's requirement that any entity must obtain and then maintain incredibly costly NRC licenses to construct and operate even the smallest and safest nuclear facilities is based on the agency's erroneous and completely unexplained interpretation of the Atomic Energy Act of 1954 ("AEA").

23. The AEA authorizes the NRC to require licenses *only* for those reactors it deems "capable of making use of special nuclear material in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public." 42 U.S.C. § 2014(cc); *id.* § 2131.

24. The statute, properly read, strikes a sensible balance: large and potentially risky nuclear facilities require NRC licenses, but facilities not "capable of making use of special nuclear material in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public," do not need such a license. *Id.* § 2014(cc). To be clear, this regime hardly gives free rein to operators of even small, safe reactors. Such operators still must comply with the NRC's stringent oversight of the special nuclear material that fuels reactors, not to mention state regulation,

[1] Accession numbers can be used to obtain the documents on the NRC's Agencywide Documents Access and Management System ("ADAMS"), *available at* https://www.nrc.gov/reading-rm/adams.html.

export controls, restrictions on nuclear weapons production, and prohibitions on weapons-grade nuclear material. Further, state governments would retain, and likely exercise, their traditional power to regulate power generation within their borders. *See, e.g.*, *PG&E v. State Energy Comm'n*, 461 U.S. 190, 205 (1983).

25. Both Congress and the NRC's predecessor—the Atomic Energy Commission ("AEC")—recognized at the time of the AEA's passage that at least *some* class or classes of nuclear reactors would fall outside the AEC's licensing authority.

26. The error of the AEC's (and now the NRC's) misinterpretation of the AEA is best demonstrated by highlighting how that statute differs from its predecessor—the Atomic Energy Act of 1946, commonly known as the McMahon Act. The McMahon Act granted the AEC sweeping licensing authority over "*any* equipment or device capable of making use of fissionable material or peculiarly adapted for making use of atomic energy" and "*any* equipment or device capable of such production." Atomic Energy Act of 1946, Pub. L. No. 79-585, § 18(f)–(g), 60 Stat. 755, 774 (1946) (emphases added).

27. In passing the AEA in 1954, however, Congress deliberately changed course to *narrow* the AEC's licensing authority. Gone was the broad power over "any" equipment or device "capable of making use of fissionable material." Instead, Congress added a new and important limitation: the AEC had licensing authority over "utilization facilit[ies]," defined only as "any equipment or device, except an atomic weapon, determined by rule of the Commission to be *capable of making use of special nuclear material in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and*

safety of the public." 42 U.S.C. § 2014(cc) (emphasis added); *see also United States v. Wilson*, 503 U.S. 333, 336 (1992) ("[W]hen Congress alters the words of a statute, it must intend to change the statute's meaning.").

28. When the AEA was passed, both Congress and the AEC understood the new law to exclude certain reactors by imposing thresholds related to common defense, security, health, and safety. *See infra* ¶¶ 61–88. As the AEC itself put it, the AEA would give it "*flexibility to exclude from the definitions, and hence from the licensing features of the bill*, equipment or devices not capable of producing or using significant quantities of fissionable material and not important from the public health and safety standpoint." AEC, *Part IV of Draft Statement for Presentation to Joint Committee* 33 (May 27, 1954) (emphasis added). Indeed, the AEC was "glad to see these changes in definitions" because it was "unnecessary to apply the licensing provisions to the construction or operation of certain research accelerators and certain small reactors." *Id.*

29. Nonetheless, in 1956, the AEC inexplicably promulgated a rule that defined "utilization facility," for which a license is needed to operate, as "*[a]ny* nuclear reactor other than one designed or used primarily for the formation of plutonium or U-233." 21 Fed. Reg. 355, 356 (Jan. 19, 1956) (codified at 10 C.F.R. § 50.2) (emphasis added) ("Utilization Facility Rule").[2] In other words, despite recognizing Congress had narrowed

[2] There is a second way in which a facility can also be a "utilization facility" under NRC regulations ("An accelerator-driven subcritical operating assembly used for the irradiation of materials containing special nuclear material and described in the application assigned docket number 50–608"), which is irrelevant here. *See* 10 C.F.R. § 50.2.

the AEC's authority, the agency kept things exactly as they were before Congress changed the definition of utilization facility.

30. The AEC left no record of comments on this definition nor any explanation for why—contrary to the AEC's own prior view—*every* nuclear reactor necessarily uses material in such quantity as to "be of significance to the common defense and security, or in such manner as to affect the health and safety of the public." *See* 21 Fed. Reg. 355; 20 Fed. Reg. 2,486 (Apr. 15, 1955).

31. As a result, the AEC proceeded, without explanation, to require licenses even for reactors that use small amounts of special nuclear material that have no effect on U.S. defense and security and that the NRC *itself* has stated do not pose public health and safety risks. *See* NRC, White Paper, *Micro-Reactors Licensing Strategies* (Nov. 24, 2021) (Accession No. ML21328A189), https://www.nrc.gov/docs/ML2132/ML21328A189.pdf; NRC, Policy Issue (Notation Vote), SECY-24-0008, *Micro-Reactor Licensing and Deployment Considerations* 3 (Jan. 24, 2024) (Accession No. ML23207A250), https://www.nrc.gov/docs/ML2320/ML23207A250.pdf. Other authorities, including the U.S. Department of Energy ("DOE"), the International Atomic Energy Agency ("IAEA"), and the European Union ("EU") agree that SMRs with certain elements like passive-safety features are particularly safe. *See infra* ¶¶ 113–14, 129, 135.

32. As for the tiny research and test reactors at universities (Texas A&M's 5-watt reactor barely strong enough to power a small LED lightbulb), the NRC has recognized they do not pose the public health or safety risks of conventional nuclear reactors. NRC,

Backgrounder: Research and Test Reactors, *supra*, at 3, 4–5. Therefore, there is no reason (and the NRC has never offered any) why these reactors should be classified as utilization facilities requiring NRC licensure.

33. Because the NRC demands licenses and continued maintenance of those licenses for reactors that are outside its scope of authority, the Utilization Facility Rule exceeds the NRC's statutory authority and is not in accordance with law. 5 U.S.C. § 706(2)(A), (C). The rule is also arbitrary and capricious because the agency failed to "articulate a satisfactory explanation" for including the smallest and safest reactors within its regulatory ambit and "entirely failed to consider an important aspect of the problem," i.e., the statutory exception to "utilization facility" for small reactors insignificant to the common defense and not affecting public health and safety. *Id.* § 706(2)(A); *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 44 (1983). That failure is especially striking given that the agency expressly recognized its scope of authority had been narrowed by statute—but then adopted the exact same interpretation it had used before the statutory change.

34. Plaintiffs seek vacatur of the Utilization Facility Rule and remand to the NRC for a new rulemaking that considers the statutory common-defense and public-health-and-safety limitations. Additionally, Plaintiffs seek a declaration that the Universities' research and test reactors, and Last Energy's, Deep Fission's, and Valar Atomics's proposed SMRs and microreactors, are not utilization facilities for purposes of the AEA.

PARTIES

35. Plaintiff State of Texas is a sovereign State of the United States of America.

36. Plaintiff State of Utah is a sovereign State of the United States of America.

37. Plaintiff State of Louisiana is a sovereign State of the United States of America.

38. Plaintiff State of Florida is a sovereign State of the United States of America.

39. Plaintiff Arizona State Legislature is the elected representative portion of the legislative authority of the State of Arizona, a sovereign State of the United States of America. Ariz. Const. art. IV, pt. 1 § 1. The Arizona Legislature consists of the thirty-member State Senate and the sixty-member House of Representatives. It is directly elected by the people of Arizona. By rule, each house of the Arizona State Legislature has delegated to its presiding officers, President Warren Petersen and Speaker Steve Montenegro, the authority to raise and defend in any forum "any claim or right arising out of any injury to the [chamber]'s powers or duties under the constitution or laws of this state." *See* Ariz. Senate Rule 2(N); Ariz. House of Reps. Rule 4(K). President Petersen and Speaker Montenegro have exercised this authority to join the Arizona State Legislature as a co-plaintiff in this lawsuit.

40. Plaintiff Last Energy is a private commercial developer of nuclear energy that focuses on SMRs and microreactors. It was founded in 2019 and had its first safety case documentation prepared in 2022.

41. Plaintiff Deep Fission is a private commercial developer of nuclear energy that focuses on small reactors based on conventional technology placed in a unique location—deep underground. It was founded in 2023.

42. Plaintiff Valar Atomics is a private commercial developer of nuclear energy that focuses on small HTGR reactors to provide grid-independent power. It was founded in 2023.

43. Defendant United States Nuclear Regulatory Commission is an agency of the United States.

JURISDICTION AND VENUE

44. The Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 2201(a). This action arises under 5 U.S.C. §§ 702–04, 706 and 28 U.S.C. §§ 1331, 1346, and 1361.

45. Venue is proper in this district pursuant to 28 U.S.C. § 1391(e) because Defendant is a United States agency, the State of Texas is a resident of this judicial district, *see, e.g.*, *Utah v. Walsh*, No. 2:23-cv-016-Z, 2023 WL 2663256, at *3 (N.D. Tex. Mar. 28, 2023) ("Texas resides everywhere in Texas.") (collecting authorities), and the case involves no real property.

46. Jurisdiction and venue in this Court are proper under the Administrative Procedure Act ("APA") because no adequate "special statutory review proceeding relevant to the subject matter" applies. 5 U.S.C. § 703; *see also id.* § 704 (making reviewable final agency action "for which there is no other adequate remedy in a court"). Notably, this

action is not subject to the Administrative Orders Review Act, also known as the Hobbs Act. 28 U.S.C. Ch. 158. The Hobbs Act directs review of "final orders" of the NRC "made reviewable by section 2239 of title 42" to the courts of appeals. *Id.* § 2342. Section 2239, in turn, makes reviewable, among others, a "final order" in "any proceeding ... for the granting, suspending, revoking, or amending of any license or construction permit, or application to transfer control, and in any proceeding for the issuance or modification of rules and regulations dealing with the activities of licensees." 42 U.S.C. § 2239(a)(1)(A), (b)(1). This action does not fall within the scope of Section 2239 for at least two reasons. First, because the challenged regulation is not an "order," but a "rule." *See* 42 U.S.C. § 2231(a) (adopting the APA's definitions); 5 U.S.C. § 551(6) (under the APA, "'order' means "the whole or a part of a final disposition ... of an agency *in a matter other than rule making*" (emphasis added)); 42 U.S.C. § 2014(cc) (what constitutes a "utilization facility" is "determined by *rule* of the Commission" (emphasis added)). Second, because the challenged regulation does not "deal[] with the activities of licensees," 42 U.S.C. § 2239(a)(1)(A), but rather determines whether a person must apply for a license at all.

47. The action is timely. Claims under the APA are governed by the default statute of limitations for suits against the United States, which requires the complaint be "filed within six years after the right of action first accrues." 28 U.S.C. § 2401. "A claim accrues when the plaintiff has the right to assert it in court—and in the case of the APA, that is when the plaintiff is injured by final agency action." *Corner Post, Inc. v. Bd. of Governors of Fed. Rsrv. Sys.*, 603 U.S. 799, 804 (2024). Last Energy was founded in 2019 and

had its first safety case documentation prepared in 2022, and so its injuries necessarily fall within the six-year statute of limitations. Deep Fission and Valar Atomics were founded in 2023 and so their injuries are also within the statute of limitations.

48. The challenged regulation also effectively precludes Texas's concrete plans to place Last Energy's SMRs in Texas and stymies Texas's recent efforts to use such reactors to reliably, safely, and affordably expand its electric grid to support its fast-growing economy, injuries that also occurred for the first time well within the six-year statute of limitations. *See infra* ¶¶ 169–84, 221–22. The regulation blocks similar recent efforts by Utah, Louisiana, Florida, and the Arizona State Legislature to advance SMRs, hindering the development of safe and reliable nuclear power in those states. *See infra* ¶¶ 191–218. And the challenged regulation results in recurring monetary costs to Texas, Utah, and Florida to obtain and maintain licenses for their universities' small research reactors, *see infra* ¶¶ 185–90, 195–203, 213, which also constitute injury within the relevant statute of limitations.

BACKGROUND

A. Statutory Background

49. In 1946 Congress passed, and the President signed, the McMahon Act. *See* Pub. L. No. 79-585, 60 Stat. 755.

50. At the time, immediately after the Second World War, Congress was familiar with the military uses of atomic energy, but its civilian uses remained largely undetermined. *Id.* § 1(a), 60 Stat. at 755 ("The significance of the atomic bomb for military purposes is

evident. The effect of the use of atomic energy for civilian purposes upon the social, economic, and political structures of today cannot now be determined.”).

51. In 1946 the United States had a nuclear monopoly, and the McMahon Act’s “stringent security regulations” were “aimed at prolonging our monopoly.” Joint Comm. on Atomic Energy, S. Rep. No. 83-1699 (H.R. Rep. No. 83-2181), at 2 (1954), *reprinted in* 1954 U.S.C.C.A.N. 3456, 3457 (“Joint Committee Report”).

52. The McMahon Act granted the AEC[3] broad regulatory authority over, and established licensing requirements for, “facilities for the *production* of fissionable material” and “equipment or device[s] *utilizing* fissionable material or atomic energy.” Pub. L. No. 79-585, §§ 4(e), 7(a), 60 Stat. at 760, 764 (emphases added).

53. The McMahon Act defined “equipment or device utilizing fissionable material or atomic energy” as “*any* equipment or device capable of making use of fissionable material or peculiarly adapted for making use of atomic energy.” *Id.* § 18(f), 60 Stat. at 744 (emphasis added). And it defined “facilities for the production of fissionable material” as “*any* equipment or device capable of such production.” *Id.* § 18(g), 60 Stat. at 744 (emphasis added).

54. During the relatively brief period when the McMahon Act was in effect, the AEC promulgated no regulations for licensing an “equipment or device *utilizing* fissionable material or atomic energy,” and therefore did not interpret the statutory definition. AEC

[3] This authority was subsequently transferred to the NRC. *See* Energy Reorganization Act of 1974, Pub. L. No. 93-438, § 201(f), 88 Stat. 1233, 1243.

23/16, *Report on Proposed Definitions of Production and Utilization Facilities* 3 (Nov. 22, 1954) (emphasis added). But the AEC did issue regulations in 1947 for licensing "facilities for the *production* of fissionable material," *id.* (emphasis added), which it defined to include "all facilities capable of producing <u>any</u> fissionable material," *id.* (underline in original).

55. In the years following the McMahon Act's passage, as Congress's Joint Committee on Atomic Energy ("Joint Committee") explained, the world "witnessed extraordinary scientific and technical achievements in atomic energy, both on the peacetime and military sides," advancements that "proceeded much more rapidly than was expected in 1946." Joint Committee Report at 2.

56. In light of these changes, Congress passed, and the President signed, the AEA. *See* Pub. L. No. 83-703, §§ 1–3, 68 Stat. 919, 921–22; *see also* Dwight D. Eisenhower, *Statement by the President Upon Signing the Atomic Energy Act of 1954* (Aug. 30, 1954), https://perma.cc/V25W-G2YF; Dwight D. Eisenhower, *Special Message to the Congress Recommending Amendments to the Atomic Energy Act* (Feb. 17, 1954), https://perma.cc/HJ65-W2TE ("In this atmosphere, the Atomic Energy Act was written. Well suited to conditions then existing, the Act in the main is still adequate to the Nation's needs. Since 1946, however, there has been great progress in nuclear science and technology.... Many statutory restrictions, based on such actual facts of 1946 as the American monopoly of atomic weapons and limited application of atomic energy in civilian and military fields, are inconsistent with the nuclear realities of 1954.").

57. According to the Joint Committee Report, the "primary purpose" of the AEA was "to bring the Atomic Energy Act of 1946 into accord with atomic progress and to make our Nation's legislative controls better conform with the scientific, technical, economic, and political facts of atomic energy as they exist today." Joint Committee Report at 1.

58. The AEA in turn describes its purpose as ensuring that atomic energy would "make the maximum contribution to the general welfare, subject at all times to the paramount objective of making the maximum contribution to the common defense and security," and at the same time "promote world peace, improve the general welfare, increase the standard of living, and strengthen free competition in private enterprise." 42 U.S.C. § 2011; Pub. L. No. 83-703, § 1, 68 Stat. at 921.

59. Congress passed the AEA because it believed that "changing conditions now not only permit but require a relaxation of" what it described as "the stringent prohibitions of the Atomic Energy Act of 1946" "if atomic energy is to contribute in the fullest possible measure to our national security and progress." Joint Committee Report at 9.

60. Accordingly, in the AEA, Congress narrowed the class of nuclear facilities for which the AEC was authorized to require a license.

61. The AEA, like the McMahon Act before it, imposed a licensing requirement on "production facilities" and "utilization facilities." *Compare* Pub. L. No. 83-703, § 101, 68 Stat. at 936 ("It shall be unlawful, except as provided in section 91, for any person within the United States to transfer or receive in interstate commerce, manufacture, produce,

transfer, acquire, possess, import, or export any utilization or production facility except under and in accordance with a license issued by the Commission pursuant to section 103 or 104."), *with* Pub. L. No. 79-585, § 7(a), 60 Stat. at 764 ("It shall be unlawful, except as provided in sections 5(a)(4)(A) or (B) or 6(a), for any person to manufacture, produce, or export any equipment or device utilizing fissionable material or atomic energy or to utilize fissionable material or atomic energy with or without such equipment or device, except under and in accordance with a license issued by the Commission authorizing such manufacture, production, export, or utilization.").

62. But the scope of the AEA's licensing requirement was noticeably narrower than under the McMahon Act.

63. *First*, Congress simplified the terms "equipment or device utilizing fissionable material or atomic energy" and "facilities for the production of fissionable material" (for which a license was required under the McMahon Act) and now referred to them only as a "utilization facility" and "production facility," respectively (for which a license was required under the AEA). *See* 42 U.S.C. § 2014(v), (cc).

64. *Second*, Congress changed the definitions of these terms, limiting their scope. The AEA defined a "production facility" as "any equipment or device *determined by rule of the Commission to be capable of the production of special nuclear material in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public*." *Id.* § 2014(v) (emphasis added).

65. The AEA similarly defined "utilization facility" as "any equipment or device, except an atomic weapon, *determined by rule of the Commission to be capable of making use of special nuclear material in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public, or peculiarly adapted for making use of atomic energy in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public*." *Id.* § 2014(cc) (emphasis added).[4]

66. These changes to the statutory text were dramatic. Previously *any* equipment or device capable of utilizing nuclear material was deemed a utilization facility that required federal licensing. But now "utilization facility" notably *excluded* facilities that did not "mak[e] use of special nuclear material in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public." *Compare id.*, *with* Pub. L. No. 79-585, § 18(f), 60 Stat. at 774.

67. By limiting the definition of "utilization facility," Congress in turn limited the AEC's licensing power to only those reactors using "special nuclear material in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public." 42 U.S.C. § 2014(cc). Congress's intention to

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[4] Both definitions included a second category covering "any important component part especially designed for such equipment or devices, as determined by the Commission," language that was left essentially untouched by the AEA in 1954. *Cf.* Joint Committee Report at 35–37. This category is irrelevant for the purposes of this lawsuit because, for such component parts to qualify, they must first be designed for use in a utilization facility. If a reactor is not a utilization facility, its components are not covered either.

have certain facilities excluded from the licensing requirement is evident from Section 109 of the AEA. Pub. L. No. 83-703, § 109, 68 Stat. at 939 (codified at 42 U.S.C. § 2139(a)). There, the AEA authorizes the AEC to issue general licenses for certain activities "*[w]ith respect to those* utilization and production facilities which are so determined by the Commission pursuant to section 2014(v)(2) or 2014(cc)(2) of this title." 42 U.S.C. § 2139(a) (emphasis added).

68. While this provision suggests the AEC was given discretion, it further indicates that *some* facilities should be excluded entirely from the definition of "utilization facility," because of the common-defense and public-health-and-safety limitations added in 42 U.S.C. § 2014. The AEC could determine how and where to set the threshold of which facilities did not need to be licensed as utilization facilities—based on factors like size, energy output, amount and type of nuclear material, safety features of the facility, amount of potential radiation exposure, distance from population, or some combination thereof—but the statute required the agency to establish *some* threshold, not just unthinkingly sweep in every single facility, as the prior statute had done.

69. It was recognized at the time that these definitional changes would limit the scope of the regulatory authority of the AEC—and today's successor, the NRC—by excluding some classes of reactors as "utilization facilities."

70. The Joint Committee recognized that "changing conditions now … require a relaxation of [earlier] prohibitions," Joint Committee Report at 9, and thus under the AEA's narrowed definition of "production facility," there would be some facilities "exempt from

licensing as a facility, though the owner must still have a license for any special nuclear material involved," *id.* at 12. These exempt facilities were those that did not meet the definitional requirements to be "capable of the production of special nuclear material in such quantity as to be of significance to the common defense and security or in such manner as to affect the health and safety of the public." *Id.* at 11–12.

71. Because " '[u]tilization facility' has a definition parallel to that of 'production facility' but based on the utilization … rather than on the production of special nuclear material," *id.* at 12, some utilization facilities were similarly exempt from licensing.

72. The AEC itself also recognized and acknowledged that the AEA's amendments narrowed the scope of facilities subject to the AEC's licensing authority.

73. In drafting the AEA, the Joint Committee relied heavily on the AEC's feedback and testimony. On February 3, 1954, the Joint Committee circulated a draft of the AEA to the AEC, along with a definition of utilization facility similar to the McMahon Act's universal coverage. The AEC understood this definition to mean a piece of "equipment" or "device" "utilizing fissionable material or atomic energy," besides the "express[] exclu[sion] of atomic weapons." AEC 495/19, *Section by Section Analysis of Proposed Bill to Amend the Atomic Energy Act* 4 (Apr. 28, 1954).

74. On February 17, 1954, the AEC sent the Joint Committee back a draft with similar language that also tracked the McMahon Act's scope. It defined utilization facility as:

> Any equipment or device capable of utilizing fissionable material and any important component part especially designed for such equipment or devices, as determined by the Commission, but includes equipment or devices capable of utilizing energy released in the course of nuclear chain reaction of such material only to the extent that such equipment or devices are in the opinion of the Commission peculiarly adapted for such use.

AEC 495/14, *Proposed Revisions of the Atomic Energy Act* 19 (Apr. 8, 1954).

75. On May 21, 1954, the Joint Committee released a new draft of the AEA that—for the first time—narrowed the AEC's proposed definitions. AEC, *Part IV of Draft Statement*, *supra*.

76. In a memo regarding a draft statement on this version of the Act, the AEC recognized and commented favorably on the Joint Committee's new definitions of "production facility" and "utilization facility," because these definitions meant the Commission "would have flexibility *to exclude from the definitions, and hence from the licensing features of the bill*, equipment or devices not capable of producing or using significant quantities of fissionable material and not important from the public health and safety standpoint." *Id.* at 33 (emphasis added).

77. In the AEC memo, the AEC even noted that "[i]t is in our opinion unnecessary to apply the licensing provisions to the construction or operation of certain research accelerators and certain small reactors as well as other items of equipment that under the original bill would likely have fallen within the meaning of one or both of the definitions, and we are glad to see these changes in definitions." *Id.*

78. The AEC's final statement to the Joint Committee publicized the AEC's view that the definitions would give the AEC authority "to exclude from the definitions, and hence from the licensing features of the bill, equipment or devices not capable of producing or using significant quantities of special nuclear material and not important from the public health and safety standpoint." *Hearings on S. 3323 and H.R. 8862, To Amend the Atomic Energy Act of 1946, Before the J. Comm. on Atomic Energy*, 83rd Cong. 600 (June 2, 1954) (statement of AEC Comm'r Joseph Campbell), https://perma.cc/C3AY-DSRQ.

79. Therefore, both Congress and the AEC originally understood that the AEA's licensing requirement did not apply to reactors that were "not important from the public health and safety standpoint." As explained next, however, the AEC ultimately ignored this narrowing of its power and issued regulations that unthinkingly deemed *every* reactor to be within the AEC's licensing authority as a utilization facility.

B. Regulatory Background

80. Even before the AEA was signed into law, the AEC recognized that the AEA limited the AEC's licensing authority and that it would need to issue new regulations to designate which facilities would be subject to Congress's narrowed definitions and which would fall outside of its licensing jurisdiction.

81. On August 24, 1954, the AEC noted:

> Under the new legislation the Commission must determine just what equipment and devices constitute "production facilities" or "utilization facilities" and only such facilities are subject to AEC licensing control. In order to prevent a temporary lapse in AEC licensing control [after the AEA

> was to take effect on August 30], the Commission needs to make its determinations by the time the bill becomes law.

AEC 495/38, *Check List of Actions Required Under the Atomic Energy Act of 1954*, at 1 (Aug. 24, 1954); *see also id.* ("The Office of the General Counsel is presently working with a task force consisting of representatives of the Licensing Controls Branch, Divisions of Research, Biology and Medicine, and Reactor Development to prepare revised regulations covering this subject. It is hoped that they will be presented to the Commission in sufficient time so as to make publication possible by the time the Act becomes effective.").

82. Before issuing new regulations, the AEC published an interim order, which included a preliminary definition of "production facility." In relevant part, the interim order read:

> The Atomic Energy Act of 1954, as passed by Congress, subjects production facilities and utilization facilities to AEC licensing control. *The terms "production facility" and "utilization facility" are so defined that no facility is a production facility or utilization facility unless the Commission determines that it comes within the definition.*
>
> …
>
> It is proposed as an interim measure, to preclude a temporary lapse in the licensing regulations, that the Commission determine that the term "production facility" as defined in the Atomic Energy Act of 1954, has the same meaning as the term "facilities for the production of fissionable material" under the present regulations for the control of facilities for the production of fissionable material.

AEC 495/39, *Interim Orders to Be Issued Under the Atomic Energy Act of 1954*, at 1, 3 (Aug. 24, 1954) (emphasis added). This was an interim order only.

83. Though the AEC failed to promulgate rules by August 30, 1954, as it had hoped, in September 1954, the AEC asserted that promulgating rules on "production facility" and "utilization facility" remained a "top priority." AEC 495/41, *Check List of Actions Required Under the Atomic Energy Act of 1954* (Sept. 9, 1954).

84. On December 22, 1954, the AEC circulated a November 22 memorandum of the Office of General Counsel's task force, which had been assigned to develop regulations defining production and utilization facilities. *See* AEC 23/16.

85. This memorandum contained the statutory definitions of those terms, discussed their scope and purpose and important implications of their adoption, compared them with AEC definitions under the McMahon Act, and explained the reasons for differences in coverage. *Id.* at 1.

86. In the memorandum, the AEC recognized that "under the 1954 Act [the] Commission has considerably more flexibility in determining what facilities come within the respective definitions than it did under the 1946 Act." *Id.* at 4. In particular, the AEC noted that "[t]he standard is no longer whether the device is capable of producing or utilizing [special nuclear material], but whether it is capable of producing or utilizing in such quantity as to be of significance to the common defense and security or in such manner as to affect the health and safety of the public." *Id.* (underlines in original).

87. The AEC therefore recognized that being "capable of producing or utilizing" special nuclear material, *alone*, was not enough to trigger the definition of production or utilization facility, and therefore insufficient to be subject to the licensing requirement. *Id.*

Although the memo only staked out preliminary definitions, it indicated the AEC's view that some facilities would fall outside the definition of "utilization facility."

88. The AEA included numerous exceptions for types of equipment or devices. The memo offered individual justifications for each exception, including that for some devices, there was no overriding reason on health and safety grounds to assert federal control over activities "traditionally … in the province of private research and clinical medicine," *id.* at 10, and no "special reason" to assert control over certain other devices "in view of … traditional commercial developments in this field free of Federal health and safety control," *id.* at 12. Additionally, when it came to production facilities, the AEC proposed setting a quantity threshold of production capability of 100 grams per year, below which a facility would be exempt from licensing. *Id.* at 7. This proposal was based on the fact that contemporary science suggested that at least 2 kg of uranium were needed "to permit production of a weapons quantity," meaning the quantity used would not be significant to the common defense. *Id.* at 6.

89. On April 4, 1955, the AEC circulated another information paper (AEC 23/22) with markedly different proposed definitions and, on April 6, 1955, approved those definitions for publication in the Federal Register for notice and comment. AEC Meeting No. 1073 (Apr. 6, 1955). Reverting to a formulation similar to the McMahon Act's, the AEC's proposal defined "utilization facility" as "any nuclear reactor other than one designed or used primarily for the formation of plutonium or U-233." AEC 23/22, *Proposed Regulations for the Licensing of Production and Utilization Facilities* 4–5 (Mar. 30, 1955).

90. The AEC's information paper offered a vague, conclusory explanation for its new definition:

> The Atomic Energy Act of 1954 has left to the Commission the determination of what equipment and devices are production and utilization facilities. The standard of the Act is capability of production and use, respectively, of special nuclear material in such quantity or manner as to affect public health and safety or to be of significance to national security.... *The definitions of production and utilization facilities, and the items they include, were arrived at upon the basis of the health and safety and national security factors*.

Id. (emphasis added).

91. The AEC's information paper also provided a list of facilities "include[d]" under the definition of "utilization facilities" (central station power reactors, engineering test reactors, mobile reactors, package power reactors, isotope production reactors, research reactors, medical therapy reactors, chemical production reactors, and critical assemblies or zero power reactors) and a list of facilities excluded from the definitions of both utilization and production facilities (electronuclear facilities and laboratory scale experimental facilities). *Id.* at 14. The AEC offered no explanation for either of these lists.

92. During the week of December 19, 1955, the AEC circulated a final information paper (AEC 23/34) on the AEC's efforts to finalize its rule for licensing production and utilization facilities. The definition of "utilization facility" was unchanged from AEC 23/22, the earlier paper. AEC 23/34, *Regulations for Licensing of Production and Utilization Facilities* 8 (Dec. 16, 1955).

93. At a meeting on December 21, 1955, the AEC approved the final rule for the licensing and production of utilization facilities for publication in the Federal Register

"substantially in the form … [in] AEC 23/34." AEC, Meeting Minutes, Meeting No. 1159, at 861 (Dec. 21, 1955).

94. Neither the final information paper (AEC 23/34) nor the AEC's meeting minutes provide any further explanation of the definition.

95. The AEC published its final regulations implementing the AEA as *Part 50—Licensing of Production and Utilization Facilities*, 21 Fed. Reg. 355 (codified at 10 C.F.R. § 50). As proposed, the AEC defined the statutory term "utilization facility" as "*[a]ny* nuclear reactor other than one designed or used primarily for the formation of plutonium or U-233." *Id.* at 356 (emphasis added) (codified at 10 C.F.R. § 50.2). Moreover, the definition of "production facility" also omitted the exemptions and 100-gram threshold that the AEC had itself proposed. *See id.*; AEC 23/16 at 5–7.

96. The AEC offered no explanation for why *every* nuclear reactor (besides those "designed or used primarily for the formation of plutonium or U-233")[5] necessarily used material in such quantity as to "be of significance to the common defense and security, or in such manner as to affect the health and safety of the public." *See* 21 Fed. Reg. 355; 20 Fed. Reg. 2,486. Even though the statute required the AEC to make a "determin[ation] by rule of the Commission" as to which facilities should be excluded from the definition of "utilization facility," the AEC inexplicably determined that *every* facility was "capable of

[5] Although exempted as utilization facilities, these reactors are instead regulated as "production facilit[ies]" and thus subject to similar licensing requirements. *See* 10 C.F.R. § 50.2 ("Production facility means … [a]ny nuclear reactor designed or used primarily for the formation of plutonium or uranium-233[.]").

making use of special nuclear material in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public." 42 U.S.C. § 2014(cc).

97. In the time since the AEA was enacted, the AEC and NRC have issued a slew of regulations subjecting "utilization facilit[ies]" to substantial regulatory burdens. In addition to having to submit license applications for construction permits, operating licenses, manufacturing licenses, and early site permits (all of which come with filing fees, environmental reports, and other detailed requirements), 10 C.F.R. §§ 50.20–49, all licensees and permit-holders must maintain quality assurance programs, staffing levels, insurance, and extensive safety precautions, and many more standards, *see, e.g.*, *id.* § 50.54–55a. No subsequent congressional action has ratified the AEC's or NRC's definitions. Rather, Congress has consistently invoked the long-extant statutory definition, which recognizes limits on the scope of NRC's regulatory authority.

98. For example, the ADVANCE Act of 2024 states that "[t]he term 'utilization facility' has the meaning given the term in section 11 of the Atomic Energy Act of 1954 (42 U.S.C. 2014)." Pub. L. No. 118-67, div. B, § 206(a)(5), 138 Stat. 1447, 1462 (2024).

99. Likewise, the NRC Authorization Act for Fiscal Year 1980 states that "the term 'utilization facility' means a facility required to be licensed under section 103 or 104(b) of the Atomic Energy Act of 1954," and such facilities are those defined at 42 U.S.C. § 2014(cc). Pub. L. No. 96-295, § 108(a), 94 Stat. 780, 783 (1980).

100. Moreover, although Congress limited the NRC's ability to exempt certain radioactive waste as below regulatory concern, Pub. L. No. 102-486, § 2901(a), 106 Stat. 2776, 3122 (1992), Congress never withdrew the AEA's directive to NRC to exempt a category of facilities from licensing.

C. NRC's Regulatory Approach to Similar Issues

101. Although the AEC and NRC have not subsequently revised the pertinent definition in the 1956 Utilization Facility Rule in a manner relevant to this lawsuit, the NRC has recognized in related contexts that not all types of nuclear activity warrant NRC's harsh regulatory scrutiny.

102. For example, NRC regulations in existence since 1991 require that all "persons licensed by the Commission to receive, possess, use, transfer, or dispose of byproduct, source, or special nuclear material or to operate a production or utilization facility," 10 C.F.R. § 20.1002, must "conduct operations so that … [t]he total effective dose equivalent to individual members of the public from the licensed operation does not exceed … 1 mSv … in a year," *id.* § 20.1301(a)(1).

103. An "mSv" is a milli-Sievert. A "Sievert" is a measure of the "effective" amount of radiation that a person absorbs from a given exposure, which accounts for the type of radiation and the sensitivity of bodily organs to that radiation. *See* EPA, *Radiation Terms and Units* (updated May 16, 2024), https://perma.cc/X368-EJ39. As a result, the dose measured in Sieverts can provide an indication of the potential for adverse health effects from a given exposure. *Id.* A "milliSievert" is one one-thousandth of a Sievert. For

comparison, a single computed tomography ("CT") scan of the abdomen typically exposes a person to approximately 8 mSv. *See* FDA, *What Are the Radiation Risks from CT?* (Dec. 5, 2017), https://www.fda.gov/radiation-emitting-products/medical-x-ray-imaging/what-are-radiation-risks-ct.

104. This existing regulation, which recognizes that nuclear activity is not inherently dangerous but rather should be subject to thresholds based on quantifiable exposure risks, tracks prior NRC policy statements. Most notably, the NRC's 1990 Policy Statement, issued after extended discussion, "establishe[d] the framework within which the Commission will formulate rules or make licensing decisions to exempt from some or all regulatory controls certain practices involving small quantities of radioactive material." 55 Fed. Reg. 27,522, 27,522 (July 3, 1990); *see also* NRC, SECY-89-184, Meeting Transcript, *Briefing on Policy Statement on Rules for Exemption From Regulatory Control* (July 11, 1989) (Accession No. ML15153A126), https://www.nrc.gov/docs/ML1515/ML15153A126.pdf.

105. The 1990 Policy Statement's exemption was not applied to licensing of facilities, but still covered a wide range of practices exposing the public to radioactive material, including releasing property to the general public, distributing "consumer products containing small amounts of radioactive material," disposing of nuclear waste not in established facilities, and recycling "slightly contaminated equipment and materials." 55 Fed. Reg. at 27,522. Rather than take the tack it did in 1956 (as the AEC), this time the NRC imposed thresholds that track human safety: the maximum allowable individual dose of radiation would be 0.1 mSv per year "for each exempted practice." *Id.* at 27,522, 27,527. It

also established "a collective dose criterion" of "10 person-[Sv] per year" (the equivalent of 10,000 persons receiving 1 mSv per year, or 100,000 persons receiving 0.1 mSv per year, and so on) as a threshold ceiling for what would be "Below Regulatory Concern." *Id.*

106. The NRC's reasoning and justification for its "formulation of exemptions from regulatory control," *id.* at 27,525, is worth considering, given the NRC's failure to establish similar limits for licensing nuclear facilities. The risks from exposure were so low that the NRC opted not to even "consider whether a practice is justified in terms of net societal benefit" when weighed against costs from increased radiation exposure. *Id.* at 27,526. Instead, "[t]he principal consideration in exempting any practice from some or all regulatory controls hinges on the general question of whether" such controls are "necessary to protect the public health and safety and the environment." *Id.* This accords with the statutory directive regarding nuclear facilities, which directs the NRC to exempt facilities that do not threaten public health and safety, or the common defense. *See* 42 U.S.C. § 2014(cc).

107. To calculate its individual dose criterion of 0.1 mSv, the NRC relied on exposure to radiation "commonly accepted by … individuals without significant efforts to reduce them." 55 Fed. Reg. at 27,526. Round-trip coast-to-coast airplane flights result in exposure of about 0.05 mSv of radiation, as does the additional radiation from living in a frame vs. brick house, and there is even a 0.6–0.7 mSv difference in annual doses of radiation just between living in Denver, Colorado, and Washington, D.C. *Id.* at 27,526–27.

108. The NRC also issued a 1986 Policy Statement that allowed for "expedit[ed] handling of petitions for rulemaking to exempt specific radioactive waste streams from disposal in a licensed low-level waste disposal facility," which again demonstrates that not all nuclear activity is inherently dangerous as a regulatory matter. 51 Fed. Reg. 30,839, 30,839 (Aug. 29, 1986).

109. The NRC later withdrew the 1986 and 1990 Policy Statements, following their revocation in the Energy Policy Act of 1992. NRC, Press Release No. 93-114, *NRC Withdraws Below Regulatory Concern Policy Statements* 1 (Aug. 18, 1993) (Accession No. ML003702922), https://www.nrc.gov/docs/ml0037/ML003702922.pdf; *see* Pub. L. No. 102-486, § 2901(a), 106 Stat. at 3122 (adding section 276 to the AEA).

110. But to be clear, the revocation was not premised on a belief that the Policy Statements were unlawful in any way or premised on faulty science. Indeed, NRC itself proclaimed afterwards that Congress "did not, however, revoke the [NRC's] authority under the Atomic Energy Act to exempt classes of radioactive materials from licensing." NRC, Press Release No. 93-114, *supra*, at 2.

111. Rather, the revocations were part of amendments where Congress stated that "any State" would have "authority … to regulate, on the basis of radiological hazard, the disposal or off-site incineration of low-level radioactive waste, if the Nuclear Regulatory Commission, after the date of the enactment of the Energy Policy Act of 1992 exempts such waste from regulation." 106 Stat. at 3122.

112. Thus, the revocations made *even clearer* that (1) the NRC could lawfully determine certain nuclear acts present a low-enough risk of radiation that they do not need to be regulated by the NRC, and (2) states are more than capable of regulating those lower-threshold activities.

D. Factual Background

113. Small modular reactors are technologically advanced nuclear reactors with smaller electrical power generation capacity than conventional large reactors. The NRC recognizes that SMRs are distinct and treats them differently in assessing fees on nuclear facilities. 10 C.F.R. § 171.15(d). The NRC and the IAEA each classifies SMRs as having capacity of up to 300 MW(e),[6] 10 C.F.R. § 170.3; Joanne Liou, *What are Small Modular Reactors (SMRs)?*, IAEA (Sept. 13, 2024), https://perma.cc/YS4D-D62G, although the SMRs at issue here are noticeably smaller—e.g., in the range of 20 MW(e) or smaller, *see, e.g.*, Last Energy, *Technology Fact Sheet*, https://perma.cc/C8VZ-TGGY (downloaded Dec. 30, 2024).

[6] MW(e) refers to "megawatt electrical," i.e., the amount of electric power (in megawatts) produced by an electric power generator. MW(e) is distinguished from the unit of power "megawatt thermal," abbreviated MWt, which refers to the amount of thermal power inputted. *See Glossary of Terms in PRIS Reports*, IAEA, https://perma.cc/4L6X-NRAK (last visited Oct. 30, 2024). The difference between the two measurements is the amount of waste power lost as heat. Nuclear power plants typically have a thermal efficiency percentage (i.e., MW(e)/MWt) of approximately 33%, with some of the most advanced reactors reaching 40% efficiency. *See Nuclear Power Reactors*, World Nuclear Ass'n (Aug. 27, 2024), https://perma.cc/8ULS-T2QB; *Advanced Nuclear Power Reactors*, World Nuclear Ass'n (Apr. 1, 2021), https://perma.cc/WFQ4-QTUW. SMRs have the potential to have thermal efficiencies higher still. *Small Nuclear Power Reactors*, World Nuclear Ass'n (Feb. 16, 2024), https://perma.cc/DN6B-9KAT.

114. Microreactors are a subset of SMRs the IAEA has classified as having an electrical power generation capacity of up to 10 MW(e) and having much smaller footprints than even most SMRs. Liou, *What are Small Modular Reactors (SMRs)?*, *supra*.

115. The DOE has observed that SMRs typically offer numerous advantages over traditional nuclear power plants. These include lower cost and capital investment because SMR units are typically modular, prefabricated, and then installed on site; a smaller footprint, creating greater siting flexibility and allowing deployment in locations inaccessible to conventional nuclear reactors; less frequent refueling; greater efficiency, especially when coupled with other energy sources; and faster construction time, allowing for incremental deployment. *Benefits of Small Modular Reactors (SMRs)*, Off. of Nuclear Energy, Dep't of Energy, https://perma.cc/8255-D9GS (last visited Oct. 30, 2024); Liou, *What are Small Modular Reactors (SMRs)?*, *supra*.

116. In addition to nuclear power reactors, the NRC also regulates 31 research and test reactors, mostly at universities or colleges. NRC, *Backgrounder: Research and Test Reactors*, *supra*, at 1, 5–6. Such reactors are typically even smaller than commercial power microreactors and range from a few MWt on the high side to just a few Wt on the low side.

117. The University of Texas at Austin maintains an operating license for a TRIGA Mark II nuclear reactor located in Austin, Texas, with a power level of 1.1 MWt.[7]

[7] *See supra* note 6 (explaining the difference between MW(e) and MWt).

See University of Texas, U.S. NRC (updated Jan. 27, 2021), https://www.nrc.gov/info-finder/nonpower/utx-tx-triga.html.

118. Texas A&M University maintains operating licenses for two research and test reactors, both located in College Station, Texas. It operates a TRIGA Mark I reactor with a power level of 1 MWt and an AGN-201M reactor with a power level of only 5 Wt. *See Texas A&M University (TRIGA)*, U.S. NRC (updated Apr. 9, 2020), https://www.nrc.gov/info-finder/nonpower/tamu-tx-triga.html; *Texas A&M University (AGN-201M)*, U.S. NRC (updated Apr. 9, 2020), https://www.nrc.gov/info-finder/nonpower/tamu-tx-agn.html. Five Wt is likely not enough to power even a household LED lightbulb. *See supra* note 6; Jacob Marsh, *How Many Watts Does a Light Bulb Use?*, Energy Sage (Mar. 1, 2024), https://perma.cc/AR3T-EZX8. The 5-Watt reactor is too small to even facilitate research, so it "is used primarily to support education programs rather than research." *AGN-201M*, Tex. A&M Univ., Dep't of Nuclear Eng'g, https://perma.cc/R5AE-QRGD (last visited Oct. 30, 2024).

119. The University of Utah maintains an operating license for a TRIGA Mark I nuclear reactor with a power level of 100 kWt located in Salt Lake City, Utah. *See University of Utah (TRIGA)*, U.S. NRC, https://www.nrc.gov/info-finder/nonpower/uut-ut-triga.html (updated Oct. 4, 2019).

120. The University of Florida maintains an operating license for an Argonaut nuclear reactor with a power level of 100 kWt located in Gainesville, Forida. *See University*

of Florida (Argonaut), U.S. NRC, https://www.nrc.gov/info-finder/nonpower/ufl-fl-argonaut (updated Feb. 27, 2020).

Certain Reactors Do Not Meet the "Quantity" Threshold

121. Recall from above that Congress made the NRC's licensing authority turn on two inquiries: (1) whether the reactor is "capable of making use of special nuclear material in such quantity as to be of significance to the common defense and security," and (2) whether the reactor uses nuclear material in "such manner as to affect the health and safety of the public." 42 U.S.C. § 2014(cc).

122. Turning to the first requirement, i.e., whether the reactor uses a quantity of nuclear material that is of significance to common defense and security. The SMRs and microreactors at issue here do not fall within that definition for several reasons.

123. *First*, the type of fuel used in such reactors is not the same as the nuclear material the U.S. military uses for weapons. The NRC defines "strategic special nuclear material" as "uranium-235 (contained in uranium enriched to 20 percent or more in the U-235 isotope), uranium-233, or plutonium." 10 C.F.R. § 73.2. But even SMRs proposed to operate at the highest levels of enrichment do not exceed the 20% U-235 threshold to be considered using "strategic special nuclear material." *See Small Nuclear Power Reactors*, *supra* note 6.

124. Enrichment greater than 20% is generally considered highly enriched uranium ("HEU"), while weapons-grade uranium is typically enriched to 90%. *See Fissile Materials*

Basics, Union of Concerned Scientists (updated Aug. 28, 2024), https://perma.cc/9QAZ-X5QM.

125. *Second*, the volume used by research reactors is so small that it is not "of significance to the common defense and security." 42 U.S.C. § 2014(cc). For example, the Texas Universities' reactors contain less than 1 kg of U-235. Tex. A&M Univ., *Texas A&M University AGN-201M Reactor Facility License No. R-023, Docket No. 50.059, License Renewal Application, Safety Analysis Report, Technical Specifications, Environmental Considerations, and Operator Requalification Program*, at 4-1, 4-2 (July 22, 1997) (Accession No. ML102790087), https://www.nrc.gov/docs/ML1027/ML102790087.pdf (665 grams); Univ. of Tex. at Austin, *University of Texas at Austin Nuclear Engineering Teaching Laboratory TRIGA Research Reactor, License No. R-129, Docket No. 50-602, Updated Safety Analysis Report in Support of the License Renewal Application*, at 4-1 (Aug. 4, 2023) (Accession No. ML23279A146), https://www.nrc.gov/docs/ML2327/ML23279A146.pdf (38 grams). Although the University of Utah's reactor is licensed to use up to 7.5 kg, it may use only up to 10 grams enriched beyond 20%. NRC, *Issuance of Renewed Facility License No. R-126 for the University of Utah Nuclear Research Reactor* (Oct. 31, 2011) (Accession No. ML112500321), https://www.nrc.gov/docs/ML1125/ML112500321.pdf.

126. Such small quantities (especially of lower-enriched uranium) do not qualify for NRC regulation under section 2014(cc). Indeed, the NRC itself has deemed a quantity of less than 1 kg of U-235 with an enrichment level of less than 20% as not even meeting the threshold to be "special nuclear material of low strategic significance." 10 C.F.R. § 70.4.

Yet the NRC inconsistently deems research reactors like the Universities' as still being licensing facilities.

127. In 2023, all civilian nuclear power reactors in the United States *combined* purchased a total of about 2.6 million pounds of the relevant type of uranium (U_3O_8 or equivalent) from sources in the United States. U.S. Energy Info. Admin., *2023 Uranium Marketing Annual Report* 2, 4 (June 6, 2024), https://perma.cc/3ATA-FGRY (51.6 million pounds worldwide, of which 5% came from United States sources). That barely put a dent in the nation's economically mineable reserves of U_3O_8, which are estimated to be nearly 500 times larger, at 1,227 million pounds. *U.S. Uranium Reserves Estimates*, U.S. Energy Info. Admin. (July 2020), https://perma.cc/BY66-H2CV.

Certain Small Reactors Do Not Meet the "Manner" Threshold

128. Turning to the second statutory requirement, i.e., whether the reactors use nuclear material in "such manner as to affect the health and safety of the public." 42 U.S.C. § 2014(cc).

129. Even before the prevalence of many of the safety features that are built into typical modern SMRs, nuclear power was already far safer than almost every other leading form of power generation. *See Infographic: What Makes Nuclear Energy Safe?*, IAEA (Jul. 1, 2022), https://www.iaea.org/newscenter/news/infographic-what-makes-nuclear-energy-safe. For example, hydropower results in 43 times as many deaths as nuclear power, natural gas 93 times as many, biomass 153 times as many, oil 613 times many, and brown coal 1,090 times as many. *Id.* Even wind power is deadlier, and solar power is barely safer. *Id.*

130. In fact, in terms of radiation exposure alone, fly ash—an emission from power plants burning coal—is far more radioactive than emissions from nuclear waste. Fly ash emitted by a coal plant can release up to 100 times more radiation into the atmosphere than a nuclear power plant producing the same amount of energy. Mara Hvistendahl, *Coal Ash is More Radioactive Than Nuclear Waste*, Sci. Am. (Dec. 13, 2007), https://perma.cc/ABA9-9X26.

131. SMRs of the type at issue in this case would release dramatically less radiation than any of those other sources. The DOE has explained that typically:

> SMR designs have the distinct advantage of factoring in current safeguards and security requirements. Facility protection systems, including barriers that can withstand design basis aircraft crash scenarios and other specific threats, are part of the engineering process being applied to new SMR design. SMRs also provide safety and potential nonproliferation benefits to the United States and the wider international community. Most SMRs will be built below grade for safety and security enhancements, addressing vulnerabilities.

Benefits of Small Modular Reactors (SMRs), *supra*.

132. The NRC itself has noted that "[i]n accordance with Commission expectations, SMRs … might have risk profiles significantly lower than the Commission's Safety Goals and the potential radiological releases from SMRs … are expected to be smaller than the current fleet of large [light water reactors]." NRC, *Siting Considerations Related to Population for Small Modular and Non-Light Water Reactors* 1 (Nov. 29, 2017) (Accession No. ML17333B158), https://www.nrc.gov/docs/ML1733/ML17333B158.pdf.

133. Because SMRs designed with passive safety features would have far smaller potential radiological releases, even in the event of a catastrophe, an SMR sited away from populated areas according to traditional NRC rules, *see* AEC, TID-14844, *Calculation of Distance Factors for Power and Test Reactor Sites* (Mar. 23, 1962) (Accession No. ML021720780), https://www.nrc.gov/docs/ML0217/ML021720780.pdf; Oak Ridge Nat'l Lab'y, ORNL/TM-2019/1197, *Advanced Reactor Siting Policy Considerations* (June 2019) (Accession No. ML19192A102), https://www.nrc.gov/docs/ML1919/ML19192A102.pdf, would have minimal health and safety risks.

134. In fact, the NRC even stated that "[a]s a result" of these lower safety risks, SMRs "could be located closer to densely populated centers, if one were to focus exclusively on the criteria related to potential radiological doses to individuals." NRC, *Siting Considerations*, *supra*, at 1. The IAEA has reached a similar conclusion, noting that typical SMRs possess "increased safety margins," which "in some cases, eliminate or significantly lower the potential for unsafe releases of radioactivity to the environment and the public in case of an accident." Liou, *What are Small Modular Reactors (SMRs)?*, *supra*.

135. The European Union has likewise recognized that typically:

> SMRs have *passive (inherent) safety systems*, with a simpler design, a reactor core with lower core power and larger fractions of coolant. These altogether increase significantly the time allowed for operators to react in case of incidents or accidents.
>
> SMRs safety principles mostly rely on simple phenomena like *natural circulation* for the cooling of the reactor core, even during incident or accident situations requiring very limited, or even no operators' actions to bring the reactor to a safe state in case of need.

> These passive safety systems also allow *elimination of a range of components*, valves, safety grade pumps, pipes and cables limiting de facto the risk of their failure.

Small Modular Reactors Explained, Eur. Union, https://perma.cc/F9WZ-XYLY (last visited Oct. 30, 2024) (emphases in original).

136. The benefits of these safety features ensure that for at least those types of SMRs at issue here, there is no meaningful risk to "the health and safety of the public." 42 U.S.C. § 2014(cc). Members of the public would be exposed to only insignificant amounts of nuclear radiation, even in the case of a meltdown.

137. For example, Plaintiff Last Energy's SMRs utilize inherently safe design features to ensure they do not "affect the health and safety of the public." *Id.* In Last Energy's reactor designs, every aspect related to nuclear fuel or radiation potential is fully sealed in an inaccessible one-foot-thick steel box that is resistant to every credible accident or security threat, internal or external, including temperature or mechanical force. The reactor does not have enough energy to melt through the walls or floor. Passive features ensure no radiation can escape the reactor room, and no human can get in, thus effectively eliminating any concerns regarding public safety.

138. Even in a worst-reasonable scenario, Last Energy's SMRs would release less than 0.01 mSv, which is *one-tenth* the exposure the NRC has said in related contexts is so safe it would not require NRC regulation, and it is *one-eight-hundredth* the exposure of just one abdomen CT scan (8 mSv). In other words, the exposure from hundreds of Last Energy SMR melt downs would still be less than from one routine CT scan. And even in these

worst-reasonable scenarios, the radiation from the SMR would much more likely be closer to zero than to 0.01 mSv.

139. Microreactors likewise do not use nuclear material "in such manner as to affect the health and safety of the public." 42 U.S.C. § 2014(cc). The NRC *itself* has noted that for microreactors, there are "low potential consequences in terms of radiological release[]." NRC, White Paper, *Micro-Reactors Licensing Strategies*, *supra*, at 2. According to the NRC, at least some microreactors "are anticipated to have lower potential radiological consequences with a correspondingly lower impact on public health and safety," and some "may also rely on passive systems and inherent characteristics to control reactor power and heat removal," which would have substantial safety benefits. NRC, SECY-24-0008, *Micro-Reactor Licensing and Deployment Considerations*, *supra*, at 3; NRC, SECY-24-0008, Enclosure 1, *Technical, Licensing, and Policy Considerations for Factory-Fabricated Micro-Reactors* (Jan. 24, 2024) (Accession No. ML23207A251) ("SECY-24-0008, Enclosure"), https://www.nrc.gov/docs/ML2320/ML23207A251.pdf.

140. The case is even more obvious for research and test reactors, which are often too small to have any effect on "the health and safety of the public." 42 U.S.C. § 2014(cc). The NRC itself recognizes that research and test reactors do not pose the same health and safety risks as conventional nuclear reactors:

> Research and test reactors are typically licensed by the NRC according to the total thermal (heat) energy produced by the reactor. These facilities range in size from 0.10 watt to 20 megawatts-thermal. In contrast, a typical commercial nuclear power reactor is rated at 3,000 megawatts-thermal. *Because of this large difference in power generated, the consequence of an accident*

> *at a research and test reactor is limited when compared to a commercial power reactor. For this reason, research reactors' emergency planning zones to protect the public from potential radiological accidents are well within owner-controlled areas -- often the boundary of the room in which the reactor is housed.*
>
> All research and test reactors have radiation monitors with larger facilities having monitors that measure particulate and gaseous releases to the environment.
>
> *Unlike power plants, research and test reactor control rooms are usually in the confinement or containment area where the reactor is located.* Facility staff and personnel work in the reactor room or building during operation. Most research and test reactors are in rooms or buildings that have a dedicated ventilation system and all have systems that control the release of radiation.
>
> *These reactors have fail-safe shutdown systems that monitor facility conditions, and before an unsafe condition occurs, control rods can be used to rapidly reduce the reactor power level. There are also redundant systems to shut down a reactor to provide added protection of the public.*
>
> *Because of the low power levels at which research and test reactors operate, they require no or minimal cooling for short periods after shutdown. In addition, many of these reactors operate on a very limited schedule and have a limited amount of radioactive material on hand at any given time.*

NRC, *Backgrounder: Research and Test Reactors*, *supra*, at 5 (emphases added).

141. The Universities' reactors do not use "special nuclear material … in such manner as to affect the health and safety of the public." 42 U.S.C. § 2014(cc). These tiny reactors can be built to allow for radiological release well below the safety thresholds that NRC has previously set and that other countries rely on.

142. The NRC itself has recognized as much. In a recent Environmental Assessment of a proposed NRC rule to streamline research and test facility licensing, the NRC expressly noted that the Texas Universities' reactors, like all research reactors,

> operate at low power levels, temperatures, and pressures, and have a small inventory of fission products in the fuel. Therefore, these [Non-power Production or Utilization Facilities ("NPUFs")] present a lower potential radiological risk to the environment and the public. Additionally, the consequences of the maximum hypothetical accidents (MHAs) for these facilities fall below the standards in 10 CFR part 20 for protecting the health and safety of the public.

89 Fed. Reg. at 106,240; *accord* NRC, SECY-19-0062, Enclosure 3, *Environmental Assessment and Finding of No Significant Impact Supporting Final Rule: Non-Power Production or Utilization Facility License Renewal* 12–13 (June 17, 2019) (Accession No. ML18031A004) ("SECY-19-0062, Enclosure"), https://www.nrc.gov/docs/ML1803/ML18031A004.pdf.

143. Additionally, as the NRC notes, the two larger TRIGA reactors "have cores that are submerged in tanks or pools of water that provide sufficient passive decay heat removal to prevent overheating of the fuel," 89 Fed. Reg. at 106,240, while the 5-Watt reactor is "not considered [a] tank or pool reactor[] but ha[s] [a] similarly low risk profile[]," *id.* at 106,240 n.3.

144. According to the NRC itself, "conservative accident analyses have shown that these [facilities] do not generate enough decay heat, even after extended operation at maximum licensed power, to be at risk of overheating, failure of a fission product barrier, *or posing a threat to public health and safety*." *Id.* at 106,240 (emphasis added).

145. Of course, size alone is not determinative of safety risks. But the point is that the NRC itself has confirmed that small reactors with certain safety features do not threaten public health or safety, as they allow virtually no radiation exposure to the public.

146. That *de minimis* risk of exposure was precisely what Congress had in mind when it changed the relevant statute to exclude from NRC licensing smaller and safer reactors. Yet the NRC has inexplicably declined to follow that statutory text despite essentially recognizing that many SMRs and microreactors would fall within that carve-out.

147. The NRC's failure is especially stark given its approach to highly similar contexts. For example, when it comes to licensees conducting operations, the NRC has recognized that it is supposed to draw a reasonable line—based on a quantifiable measurement of radiation exposure—rather than unthinkingly labeling everything as dangerous. *See, e.g.*, 10 C.F.R. § 20.1301(a)(1) (requiring "each licensee [to] conduct operations so that the total effective dose equivalent to individual members of the public from the licensed operation does not exceed ... 1 mSv in a year") (cleaned up). The line NRC drew in that regulation is many multiples what even a worst-reasonable scenario would yield from a Last Energy SMR.

148. Establishing a dosage threshold for safe nuclear activity is also common practice for other federal agencies and internationally. For example, the FDA—relying on both the American National Standards Institute and the National Council on Radiation Protection and Measurements—has set an "annual dose limit ... over a 12-month period" at 0.25 mSv. *Products for Security Screening of People*, FDA (Mar. 9, 2018), https://www.fda.gov/radiation-emitting-products/security-systems/products-security-screening-people. This is notably 2.5 times the annual dose limit that the NRC recommends for the general public. 10 C.F.R. § 20.1301(a)(1). It is also far less radiation than an

individual will receive from most CT scans, which can range from 0.18 mSv for a cone beam dental CT scan to over 22 mSv for certain whole-body CT scans. *Radiation Dose*, RadiologyInfo.org (Nov. 1, 2022), https://perma.cc/9KVL-SNZ6.

149. The FDA has also established annual dosage thresholds for the human subjects of radioactive drugs for medical research. Depending on the organ, the annual dose may not exceed either 0.05 mSv or 0.15 mSv if the study is to "be generally recognized as safe." 21 C.F.R. § 361.1(b)(3)(i).

150. Outside the United States, dosage thresholds are common. For example, the International Commission on Radiological Protection sets a recommended annual dose limit at 1 mSv. *See* NRC, SECY-08-0092, Enclosure, *Dose Limit Comparison Chart* (June 30, 2008) (Accession No. ML081690717), https://www.nrc.gov/docs/ML0816/ML081690717.pdf. The Netherlands prohibits licenses when, "as a result of other practices inside and outside this location, … an effective dose of 1 mSv in a calendar year" is "exceeded in the case of a member of the public present outside the location." *Decree of 4 September 1969 Implementing Sections 16, 17, 19 (1) and 21 of the Nuclear Energy Act*, Authority for Nuclear Safety and Radiation Protection § 3 (last updated May 16, 2014), https://perma.cc/8J4U-VNW5. Canada has established that "[e]very licensee must ensure that the effective dose received by" a "[p]erson who is not a nuclear energy worker" in "[o]ne calendar year" to be 1 mSv. *Radiation Protection Regulations*, SOR/2000-203 § 13(1) (Can.), https://perma.cc/P4RP-7X2D. In France, "[t]he annual effective dose limit … received by a member of the public as a result of nuclear activities, is set at 1 mSv." *ASN*

2009 Annual Report, French Nuclear Safety Authority 85 (2009) (citing Article R. 1333-8 of the Public Health Code), https://perma.cc/M4GN-BYGT.

151. The UK establishes two thresholds: a Basic Safety Level ("BSL"), which is the dose that nuclear facility operators should meet, and a Basic Safety Objective ("BSO"), which represents the "doses/risks as a level where [regulators] do not consider it to be a good use of … resources or taxpayers money to pursue further safety improvements." Indus. Radiological Prot. Grp., Nuclear Inst., *The Application of ALARP to Radiological Risk* 18 (2012), https://perma.cc/S2GJ-7SNN. Notably, the UK Office for Nuclear Regulation ("ONR") sets thresholds for fault and accident conditions. "Faults lacking the potential to lead to doses of 0.1 mSv to workers, or 0.01 mSv to a hypothetical person outside the site" are so insignificant that they are "regarded as part of normal operation and may be excluded from the fault analysis." *Safety Assessment Principles for Nuclear Facilities*, Off. for Nuclear Regul. ¶ 618 (2014 ed., rev. Jan. 2020), https://perma.cc/G94C-5AP2. Furthermore, the UK sets a BSL of 1 mSv and a BSO of 0.02 mSv for the "legal limit for effective dose in a calendar year for any person off the site from sources of ionising radiation originating on the site." *Id.* ¶ 716.

152. It is unsurprising that regulators around the world—including Congress, as explained above—have deemed certain low thresholds of radiation exposure as not worth regulating. After all, an average American will receive 6.2 mSv of radiation in a typical year, mostly from background radiation. *Radiation Sources and Doses*, EPA (updated Nov. 22, 2024), https://perma.cc/4WXQ-XVRK. And SMRs like those designed by Last Energy

would be expected to release only the smallest fraction of that amount, even in the event of a meltdown.

* * *

153. The NRC thus not only stands alone but also contradicts itself by refusing to follow the statutory licensing carve-out for reactors that the NRC itself has recognized are small and safe. The NRC should have done what Congress required and what the NRC itself does elsewhere—and establish thresholds for whether reactors use nuclear material in quantities that substantially affect national defense and use that material in a manner that affects health and safety. Ready-made thresholds and measurements have long existed. But instead, the NRC reflexively pronounced, without any explanation, that no reactor, no matter how small or how safe, could *ever* satisfy Congress's test. The NRC has effectively nullified Congress's command—and Plaintiffs and millions of Americans are the ones left to pay the price in the form of higher energy prices and heightened dependence on other forms of energy, with all the resulting negative consequences.

INJURIES SUFFERED BY THE PARTIES

154. The NRC's erroneous and expansive view of its own licensing authority over reactors causes significant harms to any entity that wants to develop SMRs, microreactors, or research and test reactors, as well as to entities that want to build, install, or operate such reactors. Although "[o]nly one plaintiff needs standing for the suit to proceed," *Texas v. United States*, 126 F.4th 392, 405 (5th Cir. 2025), all Plaintiffs here have standing.

A. The NRC's Assertion of Licensing Authority Imposes Dramatic Costs and Delays

155. Under the NRC's universalist interpretation of the AEA's regulatory authorization, the operation of "*[a]ny* nuclear reactor other than one designed or used primarily for the formation of plutonium or U-233," 10 C.F.R. § 50.2, requires a construction permit and operating license, which can be combined via a Combined Construction and Operating License ("COL"), *see id.* § 52.1(a) (defining "combined license").

156. The costly and time-consuming process to obtain a COL is one of the key barriers to deployment of SMRs and microreactors in Texas, as elsewhere in the United States. This burden is all the more difficult for small companies that make smaller reactors and lack the resources of larger, established nuclear companies.

157. For example, the NRC took nearly nine and seven years, respectively, to issue licenses for the two most recently submitted conventional reactor applications for a COL. *See Combined License Applications for New Reactors*, U.S. NRC (updated July 3, 2023), https://www.nrc.gov/reactors/new-reactors/large-lwr/col.html.

158. These timelines are far too long to be practicable for many promising commercial applications for microreactors. For example, one nuclear company interested in "developing a commercially viable licensing pathway for microreactors" indicated that for commercial viability for oil and gas operations in the Permian Basin—a use-case for which microreactors would add critical value, *see infra* ¶ 179—the reactor would have to be

deployed and operational within 180 days from location identification, a fraction of the time NRC's process currently takes. Letter from Tim Williamson, Dir., Regul. & Pub. Affs., Shepherd Power, to Robert Taylor, Deputy Dir. for New Reactors, NRC (Feb. 14, 2024), https://www.nrc.gov/docs/ML2406/ML24068A021.pdf.

159. The NRC itself has recognized that—licensing aside—"[d]evelopers have suggested that self-contained micro-reactors might be ready for operation within *days to weeks* of beginning construction at the deployment site." SECY-24-0008, Enclosure at 1 (emphasis added); *see also, e.g.*, NRC, Policy Issue (Information), SECY-20-0093, *Policy and Licensing Considerations Related to Micro-Reactors* (Oct. 6, 2020) (Accession No. ML20129J985) at 1; NRC, Preliminary White Paper, *Micro-Reactor Licensing and Deployment Considerations: Fuel Loading and Operational Testing at a Factory – Released to Support ACRS Interaction* 1 (Sept. 27, 2023) (Accession No. ML23264A802).

160. Although the NRC can grant license applications for research and test reactors on a faster timeline, the most recent license application granted for such a reactor was for a research and test reactor at Abilene Christian University in Texas, which received a construction permit after almost two years of delay. NRC, Press Release No. 24-071, *NRC Issues Construction Permit for Abilene Christian University Research Reactor in Texas* (Sept. 16, 2024), https://perma.cc/5JAP-2657. The second most recent decision on a research and test reactor construction permit took over two years—and the construction permit does not allow for actual operation, which is a separate, time-intensive process. *See Hermes – Kairos*

Application, U.S. NRC (updated Oct. 25, 2024), https://www.nrc.gov/reactors/non-power/new-facility-licensing/hermes-kairos.html.

161. The ongoing licensing review for another SMR application has been pending for almost two years. *See Current Licensing Reviews of New Reactors*, U.S. NRC (updated Apr. 4, 2023), https://www.nrc.gov/reactors/new-reactors/smr/licensing-activities/current-licensing-reviews.html.

162. These timelines are typical. For example, in 2020, private company Oklo applied to the NRC for a COL for an SMR in Aurora, Colorado, and it took the NRC almost two years to deny the application, which was almost six years from Oklo's initial pre-application filed in 2016. *See Aurora – Oklo Application*, U.S. NRC (updated Sept. 18, 2022), https://www.nrc.gov/reactors/new-reactors/large-lwr/col/aurora-oklo.html.

163. On top of the costs of complying with NRC regulations to obtain a construction and/or operating license, license applicants and licensees must pay fees to the NRC. For construction permits, manufacturing licenses, operating licenses, approvals of facility standard reference designs, replacements, and other approvals, the license permit-seeker or license holder must pay a fee totaling the NRC's full cost of handling the permit or license application, "based on the professional staff time," billed at $317 per hour, "and appropriate contractual support services expended." 10 C.F.R. § 170.21; 89 Fed. Reg. 51,789, 51,791 (June 20, 2024). This not only imposes significant costs but incentivizes the NRC to drag out approvals.

164. Additionally, utilization facilities that are operating power reactors must pay annual fees of $5,336,000 (as of FY 2024), 10 C.F.R. § 171.15(b)(1), although the NRC rules state that if and when an SMR becomes operational, its annual fee might be lower, depending on the amount of power it generates, *id.* § 171.15(d)(2), (3).

165. The NRC is anticipating collecting over $808 million in fees from private parties in FY 2024. 89 Fed. Reg. at 51,790–91.

166. Even apart from specific fees, the ongoing regulatory burden is immense. One study from 2017 estimated that the average nuclear plant bears an NRC-imposed regulatory burden of $60 million annually, when fees, paperwork compliance, and capital expenditures are considered. Sam Batkins, Philip Rossetti, & Dan Goldbeck, *Putting Nuclear Regulatory Costs in Context*, Am. Action F. (July 12, 2017), https://perma.cc/9V46-VSKQ.

167. SMRs face crippling costs to get regulatory approval from the NRC. For example, NuScale spent over $500 million just to get the NRC to approve its design certification in 2020. *NuScale SMR Receives US Design Certification Approval*, World Nuclear News (Sept. 1, 2020), https://perma.cc/E42R-3TR2. This process took over 2 million hours of labor and involved over 2 million pages of information. *Id.* NuScale will still need to apply for a COL.

168. These costs ensure that SMR producers cannot develop a prototype, collect empirical data on the prototype's performance in the real world, and then iterate their models several times to perfect their performance over years. This process of iterative design and production has been pioneered with great success in other high-tech

manufacturing industries, such as the private space industry. But inability to iterate designs has caused the nuclear industry to stagnate. Most nuclear start-ups today, for example, have to rely on engineers who have never built a nuclear reactor before. This prevents the development over time of industry-wide knowledge about what engineering strategies are effective or how long certain construction processes are.

B. Texas's Injuries

169. The NRC's erroneous assertion of licensing authority over reactors has caused and continues to cause significant injury to Texas.

170. "In its electrical grid, as in so many things, Texas stands alone." *Texas v. EPA*, 829 F.3d 405, 431 (5th Cir. 2016). While other states have extensive interconnections with neighboring states, Texas is the only state in the continental United States that operates its own intrastate electric grid, which covers approximately 75 percent of Texas's land area, carries about 90 percent of the state's electrical load, and serves over 27 million customers. *ERCOT Organization Backgrounder*, ERCOT, https://perma.cc/922J-5HWB (last visited Dec. 30, 2024); ERCOT, *Fact Sheet* (Oct. 2024), https://perma.cc/H3LJ-86S2; *see also CPS Energy v. ERCOT*, 671 S.W.3d 605, 611 (Tex. 2023).

171. In recent years, Texas has experienced rapid population growth and economic development that necessitates increased power generation capacity. *See, e.g.*, Brad Johnson, *First Small Modular Nuclear Reactor of Its Kind Unveiled for Calhoun County Dow Chemical Plant*, The Texan (Aug. 18, 2023), https://perma.cc/SC4W-UK84; John Kemp, *Texas Population Growth Drives Record Electricity Use*, Reuters (Aug. 16, 2023),

https://www.reuters.com/business/energy/texas-population-growth-drives-record-electricity-use-kemp-2023-08-15/; Tsvetana Paraskova, *Texas Welcomes AI If Data Centers Build Their Own Power Plants*, OilPrice.com (Oct. 8, 2024), https://perma.cc/Q79V-3KWD.

172. On August 16, 2023, Governor Greg Abbott wrote a letter to the Public Utility Commission of Texas concerning SMR development in Texas and instructing PUCT to "evaluate advanced nuclear reactors to determine if they can provide safe, reliable, and affordable power to our grid." Letter from Governor Greg Abbott to Kathleen Jackson, *supra*, at 1.

173. Governor Abbott further instructed PUCT to "establish a working group" to:

> [F]ocus on understanding the state's role in deploying and using advanced nuclear reactors; consider all potential financial incentives available; determine nuclear-specific changes needed in the Electric Reliability Council of Texas (ERCOT) market; identify any federal or state regulatory impediments to development; and identify how the state can streamline and accelerate permitting for the building of advanced nuclear reactors.

Id.

174. Governor Abbott charged "the working group to submit a plan and recommendations to [his] office by December 1, 2024, outlining how Texas will become the national leader in using advanced nuclear energy," and reminded PUCT that "[n]uclear energy is a proven, reliable, and dispatchable generation resource," that "will become even more critical as Texas'[s] need for reliable power continues to grow." *Id.* at 2.

175. That report was finalized in November 2024 and predicted that a "medium"-level investment in SMRs over the next 26 years would "add to the state and national energy generation mix" and yield "[a]n annual average of 148,000 people employed directly and indirectly by the new SMR industry (construction, operations, manufacturing)," "$50.6 billion in new economic output in Texas," and "$27.3 billion in income to Texas workers." Tex. Advanced Nuclear Reactor Working Grp., *Deploying a World-Renowned Advanced Nuclear Industry in Texas* (Nov. 2024), https://perma.cc/2ZN9-WGHL.

176. Governor Abbott also stated his desire for the working group to develop SMRs in the state, including by working to address federal regulatory barriers in order to "dramatically expand nuclear power in the state of Texas." Foxhall, *supra*.

177. On September 28, 2023, the PUCT working group had their first meeting, initiating efforts to facilitate SMRs in Texas. Robert Walton, *Texas PUC Begins Work to Attract Advanced Nuclear Reactors, In and Out of ERCOT Market*, Util. Dive (Oct. 2, 2023), https://perma.cc/JME5-KVQ6.

178. There is significant interest in imminently establishing SMRs in Texas. In 2023, Dow and X-energy Reactor Company announced that Texas is set to be the site of the first advanced SMR outside of China and Russia. Construction is theoretically set to begin in 2026, but under current regulations, the companies first need to apply for, and be granted, a construction permit from the NRC, which can be issued to planned utilization facilities "before the issuance of a license." 10 C.F.R. § 50.23; Johnson, *First Small Nuclear Reactor*, *supra*; Dan Chalk, *Dow, X-energy to Build Small Modular Reactor Nuclear Project in Seadrift,*

Texas, Midland Daily News (May 11, 2023), https://www.ourmidland.com/news/article/seadrift-texas-site-dow-s-small-modular-reactor-18093661.php.

179. SMRs are also particularly well-suited to provide power generation for hydraulic fracturing operations in Texas, because SMRs can provide a large amount of electricity with a small footprint in remote locations. Thus, various Texas-based oil and gas organizations have sought broader availability of SMRs to power fracking operations in the Permian Basin. *See, e.g.*, *Why NOV*, Shepherd Power, https://perma.cc/EC4N-ZB5H (last visited Oct. 31, 2024) ("We're leading efforts with several major energy consumers and producers to investigate using advanced nuclear reactor technologies for the most challenging upstream oil and gas operations.").

180. But SMRs are not being constructed or operated in Texas because of prohibitive NRC regulations. As explained in more detail below, the NRC's unlawful and overburdensome regulations have effectively precluded Texas from placing Last Energy's SMRs in Texas and continue to stymie Texas's efforts to reliably, safely, and affordably expand its electric grid to support its fast-growing economy. *See infra* ¶¶ 219–24. The threat to Texas's economic development "implicate[s] [Texas's] sovereign interest in its fiscal policy." *Gen. Land Off. v. Biden*, 71 F.4th 264, 274 (5th Cir. 2023).

181. Texas also has a quasi-sovereign interest "when the 'substantial impairment of the health and prosperity of the towns and cities of the state' are at stake." *Massachusetts v. EPA*, 549 U.S. 497, 520 n.17 (2007) (quoting *Missouri v. Illinois*, 180 U.S. 208, 241 (1901)).

182. The NRC's regulations hinder the development of safe and reliable nuclear power in the state, putting Texans' "'health and prosperity,'" *id.*, at risk. Texas experienced the harms that are caused by unreliable power generation during a major power shut-off in the winter of 2021, during which hundreds of Texans died and the Texas economy suffered approximately $80–$130 billion in damage. *See* John Hellerstedt, M.D., Comm'r, Tex. Dep't of State Health Servs., *February 2021 Winter Storm-Related Deaths – Texas* (Dec. 31, 2021), https://perma.cc/LTL9-LTV3; Garrett Golding, Anil Kumar, & Karel Mertens, *Cost of Texas' 2021 Deep Freeze Justifies Weatherization*, Fed. Rsrv. Bank of Dall. (Apr. 15, 2021), https://perma.cc/B8WB-SYNR.

183. Even apart from Texas's general sovereign interests and "special solicitude," *Massachusetts*, 549 U.S. at 520 n.17, Texas has suffered concrete and particularized financial injury through its instrumentalities—including the Electric Reliability Council of Texas ("ERCOT") and Texas's public universities, the University of Texas at Austin and Texas A&M.

184. NRC's regulations cause Texas financial injury through ERCOT, which manages Texas's electric grid. *See Biden v. Nebraska*, 600 U.S. 477, 490–94 (2023) (harm to an instrumentality of the state is harm to the state). ERCOT "exercises delegated authority from the [PUCT]" and has been determined by the Supreme Court of Texas to be "an organ of [state] government." *CPS Energy*, 671 S.W.3d at 616–17; *see also id.* at 626 ("ERCOT may not exercise … corporate powers independently of the state."). All aspects of ERCOT's finances and operations are subject to the PUCT's control, Tex. Util.

Code § 39.151(d), (g), (g-1); the State of Texas selects ERCOT's governing board, *id.*; *id.* § 39.1513; and the State owns ERCOT's assets, *CPS Energy*, 671 S.W.3d at 627 (citing Tex. Util. Code § 39.151). ERCOT is thus an instrumentality of the State of Texas. By effectively precluding Texas from placing Last Energy's SMRs in Texas, NRC's regulations deny ERCOT, and so Texas, the system administration fees that ERCOT would charge to wholesale buyers and sellers of the electricity those SMRs would generate. *See* Tex. Util. Code § 39.151(e). Texas relies on these fees to fund ERCOT's operations. *See id.*; *CPS Energy*, 671 S.W.3d at 637. Texas's inability to place Last Energy SMRs in the State constitutes injury that has arisen well within the six-year statute of limitations. *See Corner Post, Inc.*, 603 U.S. at 804.

185. NRC's regulations also cause Texas financial injury through its public universities, the University of Texas at Austin and Texas A&M. Tex. Gov't Code § 572.002(10)(B) (defining "state agency" as, among other things, "a university system or an institution of higher education"). These Universities "serve[] a public purpose, acting as [Texas's] agent in the educational field." *Nebraska*, 600 U.S. at 491–92 (cleaned up). They were "created by the [Texas] legislature, [are] governed by a Board of Trustees appointed by the Governor with consent of the Senate, and report[] all of [their] expenditures to the legislature." *Id.* (cleaned up). "In short," the Texas Universities are "instrumentalit[ies] of the State, and any injury under the contract to the Universit[ies] [is] an injury to [Texas]." *Id.* (cleaned up); *see also Daniel v. Univ. of Tex. Sw. Med. Ctr.*, 960 F.3d

253, 257 (5th Cir. 2020) (recognizing public universities as "arms" and "instrumentalities" of the state).

186. As noted above, the Texas Universities' reactors are not "capable of making use of special nuclear material in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public." 42 U.S.C. § 2014(cc).

187. Despite the very small size of these three reactors, and the fact that the NRC itself has described them as not "posing a threat to public health and safety," 89 Fed. Reg. at 106,240; SECY-19-0062, Enclosure at 14, the NRC still classifies them as "utilization facilit[ies]," requiring a license. 10 C.F.R. §§ 50.2, 50.21(c); *but see* 42 U.S.C. § 2014(cc) (limiting the definition of "utilization facility" to those facilities "capable of making use of special nuclear material in such quantity as to be of significance to the common defense and security, *or in such manner as to affect the health and safety of the public*") (emphasis added).

188. The Texas Universities, like all operators of research and test universities, face a substantial and ongoing cost to comply with NRC regulations. *See* NRC, *Backgrounder: Research and Test Reactors*, *supra*. These include costs for:

- Annual inspections for reactors licensed to operate at greater than or equal to 2 MW(e) and biennial inspections for reactors that operate at below 2 MW(e). *Id.* at 2.
- Maintaining their operating license, which, according to the NRC, includes the following:

> Licensed operators must maintain their expertise through a requalification program that covers both refresher training on material covered during initial licensing and training on new or modified systems, procedures and programs. Operators must pass a comprehensive written test every two years and an annual operating test, both of which are developed and administered by reactor management. The NRC reviews these examinations as part of the inspection program and determines if the operator meets the requalification program requirements. Every six years operators are required to submit an application to renew their license. As part of the application, reactor management must certify satisfactory participation in the requalification program.

Id. at 3.

- Complying with substantial security requirements. *Id.*

189. The Texas Universities also face harm because they are subject to NRC's overly-restrictive requirements when seeking to install and operate new small reactors. For example, on November 7, 2024, Texas A&M submitted a project number request to NRC in preparation for developing multiple SMRs on its RELLIS campus, with a combined output ranging from 10 to 1,000 MW(e). *See* Letter from Tex. A&M Univ. to NRC (Nov. 7, 2024) (Accession No. ML24312A358), https://www.nrc.gov/docs/ML2431/ML24312A358.pdf; Letter from NRC to Tex. A&M Univ. (Nov. 8, 2024) (Accession No. ML24312A364), https://www.nrc.gov/docs/ML2431/ML24312A364.pdf. If not for NRC's regulations, Texas A&M would have the option of placing research SMRs on this campus without undergoing the lengthy and costly licensing process.

190. The Texas Universities thus face ongoing regulatory burdens and financial costs from complying with NRC regulations erroneously applied to the Texas Universities. They are directly regulated parties, and their ongoing "monetary harms" "readily qualify as concrete injuries under Article III." *TransUnion LLC v. Ramirez*, 594 U.S. 413, 425 (2021); *United States v. Texas*, 599 U.S. 670, 676 (2023) ("Monetary costs are of course an injury."). And under the APA, "[a] claim accrues when the plaintiff has the right to assert it in court—and in the case of the APA, that is when the plaintiff is injured by final agency action." *Corner Post, Inc.*, 603 U.S. at 804. The past and ongoing monetary costs and recurring licensing requirements demonstrate Texas has suffered—and will continue to suffer—injury within the relevant statute of limitations. *See id.*

C. Utah's Injuries

191. For many of the same reasons Texas is harmed, the NRC's erroneous assertion of licensing authority over reactors has caused and continues to cause significant injury to Utah.

192. Utah recognizes it's headed towards an energy crisis due to rapid population growth, increasing electrification of society, more energy intensive industries, and retiring baseload power sources. *See, e.g.*, *Operation Gigawatt: Powering Utah's Energy Future*, Utah Off. of Energy Dev., *supra*. To address the problem, Utah needs and plans to double its power production over the next decade via a recently announced initiative called "Operation Gigawatt." Governor of Utah, *Gov. Cox Unveils 'Operation Gigawatt,' supra*. A key component of Utah's plan requires enabling and developing clean, reliable energy

sources like nuclear. *Id.*; *see also Operation Gigawatt: Powering Utah's Energy Future*, Utah Off. of Energy Dev., *supra*.

193. But Utah's ability to use (or allow industry to use) SMRs to address the energy crisis is severely and unnecessarily restricted by the NRC's unlawful regulations.

194. Utah also has a quasi-sovereign interest "when the 'substantial impairment of the health and prosperity of the towns and cities of the state' are at stake." *Massachusetts*, 549 U.S. at 520 n.17. The NRC's regulations hinder the development of safe and reliable nuclear power in the state, putting Utahns' "'health and prosperity,'" *id.*, at risk.

195. Even apart from Utah's general sovereign interests and "special solicitude," *Massachusetts*, 549 U.S. at 520 n.17, Utah has suffered concrete and particularized financial injury through its public university, the University of Utah.

196. The University of Utah College of Engineering, Department of Civil and Environmental Engineering, includes a Nuclear Engineering Program ("UNEP"). UNEP has developed a Nuclear Engineering curriculum for engineers and scientists involved in the nuclear power industry.

197. The College of Engineering houses a General Atomics TRIGA Mark I reactor ("UUTR") to conduct research for nuclear medicine, nuclear forensics, radiation detection among other things. The UUTR is located on the campus of the University of Utah.

198. The UUTR operates under an NRC Facility Operating License No. R-126 ("license") with a 100kWt power level, as part of the teaching and research facility.

199. The University of Utah "serves a public purpose, acting as [Utah's] agent in the educational field." *Biden*, 600 U.S. at 491–92 (cleaned up). The University was "'created by the [Utah] legislature,' [is] 'governed by a Board … appointed by the Governor with consent of the Senate,' and 'report[s] all of [its] expenditures to the legislature.'" *Id.* at 492. "In short, the University [is] an instrumentality of the State, and 'any injury under the contract to the University [is] an injury to [Utah].'" *Id.*

200. As noted above, the University's reactor is not "capable of making use of special nuclear material in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public." 42 U.S.C. § 2014(cc).

201. Despite the very small size of the University's reactor, and the fact that the NRC itself has described it as not "posing a threat to public health and safety," SECY-19-0062, Enclosure at 14, the NRC still classifies it as a "utilization facility," requiring a license. 10 C.F.R. § 50.2, 50.21(c); *but see* 42 U.S.C § 2014(cc) (limiting the definition of "utilization facility" to those facilities "capable of making use of special nuclear material in such quantity as to be of significance to the common defense and security, *or in such manner as to affect the health and safety of the public*.") (emphasis added).

202. The University of Utah, like all operators of research and test universities, faces a substantial and ongoing cost to comply with NRC regulations. *See* NRC, *Backgrounder: Research and Test Reactors*, *supra*. These include costs for:

- Annual inspections for reactors licensed to operate at greater than or equal to 2 MW(e) and biennial inspections for reactors that operate at below 2 MW(e). *Id.* at 2.
- Maintaining their operating license, which, according to the NRC, includes the following:

> Licensed operators must maintain their expertise through a requalification program that covers both refresher training on material covered during initial licensing and training on new or modified systems, procedures and programs. Operators must pass a comprehensive written test every two years and an annual operating test, both of which are developed and administered by reactor management. The NRC reviews these examinations as part of the inspection program and determines if the operator meets the requalification program requirements. Every six years operators are required to submit an application to renew their license. As part of the application, reactor management must certify satisfactory participation in the requalification program.

  Id. at 3.
- Complying with substantial security requirements. *Id.*

203. The University thus faces ongoing regulatory burdens and financial costs from complying with NRC regulations erroneously applied to the University. It is a directly regulated party, and its ongoing "monetary harms" "readily qualify as concrete injuries under Article III." *TransUnion*, 594 U.S. at 425; *United States v. Texas*, 599 U.S. at 676 ("Monetary costs are of course an injury."). And under the APA, "[a] claim accrues when the plaintiff has the right to assert it in court—and in the case of the APA, that is when the

plaintiff is injured by final agency action." *Corner Post*, 603 U.S. at 804. The past and ongoing monetary costs and recurring licensing requirements demonstrate Utah has suffered—and will continue to suffer—injury within the relevant statute of limitations. *See id.*

D. Louisiana's Injuries

204. For many of the same reasons Texas and Utah are harmed, the NRC's erroneous assertion of licensing authority over reactors has caused and continues to cause significant injury to Louisiana.

205. Louisiana's long and successful history with nuclear power—two nuclear plants have safely operated in the state for nearly 40 years—positions it well to take a central role in powering the "new Southern industrial revolution." *Louisiana Is Positioning Itself to Power the Southern Renaissance*, *supra*. Louisiana recognizes that advanced nuclear technologies—including SMRs and microreactors—are necessary to supply the "clean, plentiful and reliable" power needed to support the data centers, reshored manufacturing, and other industries anticipated to drive economic growth. *Id.*; *see also* David Chernicoff, *Meta Sees $10B AI Data Center in Louisiana Using Combo of Clean Energy, Nuclear Power*, Data Ctr. Frontier (Dec. 12, 2024), https://perma.cc/5WK7-WA79. To speed adoption, Louisiana's Department of Environmental Quality announced efforts to streamline and modernize environmental permitting processes. *Louisiana is Positioning Itself to Power the Southern Renaissance*, *supra*. The Louisiana Public Service Commission has also shown support for advanced nuclear technologies, directing staff in 2023 "to study and track the

development of advanced nuclear power technology that can be used to provide electricity for ratepayers." La. Pub. Serv. Comm'n, Notice of Proceeding, Docket No. X-36987 (Sept. 27, 2023), https://perma.cc/2EP2-XX2E. More recently, the Louisiana State Legislature has considered how advanced nuclear technologies fit into the state's energy portfolio, Joint Hearing of the La. H.R. Nat. Res. & Env't Comm. and La. S. Nat. Res. Comm. (Feb. 11, 2025), https://house.louisiana.gov/H_Video/VideoArchivePlayer?v=house/2025/feb/0211_25_NR_Joint, and has introduced a bill authorizing the Secretary of Louisiana's Department of Environmental Quality to adopt rules to expedite permitting for nuclear power generation, including for the development and construction of small modular reactors, S.B. 127, 2025 Reg. Sess. (La., introduced Apr. 4, 2025) (SLS 25RS-295).

206. Louisiana's major utilities and military bases, as well as private sector entities, have also taken steps to prepare to use SMRs as next generation power sources. For example, Southwestern Electric Power Company ("SWEPCO") is involved in a project at Barksdale Air Force Base investigating SMRs as a source of reliable and resilient base power. *Meeting of Barksdale Air Force Base, SEWPCO, and Louisiana Department of Environmental Quality Representatives* (Feb. 12, 2025). As a globally strategic military installation, Barksdale's goal is to be a self-sufficient energy island in the event of a national security threat. As part of Barksdale's initiative, SWEPCO is exploring the use of SMRs to power large data centers—like those used by social media company Meta—to address the growing demand for clean, stable energy in the tech sector.

207. But Louisiana's ability to use (or allow industry to use) SMRs or microreactors to promote economic growth and provide clean, reliable energy for Louisianans is severely and unnecessarily restricted by the NRC's unlawful regulations.

208. Louisiana also has a quasi-sovereign interest "when the 'substantial impairment of the health and prosperity of the towns and cities of the state' are at stake." *Massachusetts*, 549 U.S. at 520 n.17. The NRC's regulations hinder the development of safe and reliable nuclear power in the state, putting Louisianans' "'health and prosperity,'" *id.*, at risk.

E. Florida's Injuries

209. For many of the same reasons that Texas, Utah, and Louisiana are harmed, the NRC's erroneous assertion of licensing authority over small modular reactors has caused and continues to cause significant injury to Florida.

210. Florida is experiencing rapid population growth and a high expected increase in electricity demand. Florida Power and Light's ten-year site plan states that "[a]s customers continue to move to FPL's service area and extreme weather events occur with more frequency, it is more important than ever to ensure that FPL has sufficient resources to meet the growth and provide reliable energy at all times." Fla. Power & Light, *Ten Year Power Plant Site Plan 2024–2033*, at 5 (Apr. 2024), https://perma.cc/MA6X-NRLG.

211. Exploring solutions to meet that demand, the Florida Legislature passed HB 1645, which required the Public Service Commission to "study and evaluate the technical and economic feasibility of using advanced nuclear power technologies, including

small modular reactors, to meet the electrical power needs of the state." 2024 Fla. Laws Ch. 2024-186, § 21. The Commission prepared a report that concluded that while Florida could benefit from advanced nuclear power technology to meet its long-term energy needs, "[l]icensing and construct[ing]" a "nuclear power plant[] [is a] long-lead project[]" with increased financial risk and risk of delay. Fla. Pub. Serv. Comm'n, *Advanced Nuclear Power Feasibility Report*, *supra*, at 63. Steve Swilley, Vice President of Nuclear at the Electric Power Research Institute, explained that the long development periods that nuclear projects, including SMRs, face increase costs over time. Caden DeLisa, *PSC Explores Feasibility of Nuclear Energy in Florida, but Challenges of Costs and Regulation Loom Large*, The Capitolist (Sept. 5, 2024), https://perma.cc/7AKK-4BW6.

212. The NRC's interpretation of its licensing authority over SMRs increases these long lead times and prevents Florida from fully exercising its lawful authority to license and regulate such generating sources in a manner that allows their safe deployment without unnecessary delays or permitting. Florida has a quasi-sovereign interest "when the 'substantial impairment of the health and prosperity of the towns and cities of the state' are at stake." *Massachusetts*, 549 U.S. at 520 n.17. The NRC's regulations hinder the development of safe and reliable nuclear power in the state, putting Floridians' "'health and prosperity,'" *id.*, at risk.

213. Furthermore, the University of Florida has a training nuclear reactor, built in 1959. It uses the reactor to train students to operate reactors and for laboratory courses in nuclear engineering. It also serves as a radiation/neutron source for various research

programs and experiments, such as elemental analysis of ocean sediments, and demonstrates Florida's commitment to being at the forefront of nuclear research. Like all operators of research and test universities, Florida faces a substantial and ongoing cost to comply with NRC regulations. *See supra* ¶¶ 186–90, 200–03.

F. Arizona State Legislature's Injuries

214. For many of the same reasons Texas, Utah, Louisiana, and Florida are harmed, the NRC's erroneous assertion of licensing authority over SMRs has caused and continues to cause significant injury to the Arizona and to the sovereign lawmaking authority of the Arizona State Legislature.

215. Arizona is experiencing rapid population and economic growth, which portend a significant increase in electricity demand. "The Southwest," which includes Arizona, is anticipated to have "the highest rate of load growth in the Western Interconnection" over the next decade. North Am. Elec. Reliability Corp., *2024 Long-Term Reliability Assessment* 133 (Dec. 2024), https://perma.cc/KA5Q-P6MW. "Large industrial and commercial load additions, such as data centers, have been cited as the reason for this growth." *Id.*

216. To meet this burgeoning demand, the Arizona State Legislature and Arizona utilities have supported expanding nuclear power in the state, including by advancing legislation and taking other concrete steps to add SMRs to Arizona's energy mix. For example, House Bill ("HB") 2774 would allow large industrial energy users to place SMRs in their facilities without having to obtain a certificate of environmental capability and

would exempt them from local zoning restrictions in certain circumstances. *See* MacDonald-Evoy, *Data Centers In Rural Arizona*, *supra*. Arizona House Majority Leader Micheal Carbone has observed: "Small modular reactors are a game-changer. They offer the ability to repurpose existing facilities, attract new industry, and provide clean, reliable, and affordable power to rapidly-expanding industries that are critical to national defense, like data centers." Majority Leader Carbone, *Arizona Advanced Legislation To Streamline Permitting For Small Modular Reactors*, *supra*. HB 2774 has passed the Arizona House, passed the Arizona Senate Natural Resources and Rules Committees, and is now awaiting consideration by the full Senate. *Bill History for HB 2774*, Az. State Legislature, https://apps.azleg.gov/BillStatus/BillOverview/83238 (last visited April 4, 2025).

217. Similarly, Arizona utilities have applied to the DOE for a grant to begin exploring at least one potential site for an SMR in the state. *See* Darrell Proctor, *Arizona Utilities Announce Effort to Add More In-State Nuclear Power*, Power Mag. (Feb. 5, 2025), https://perma.cc/W8ZN-427B.

218. Arizona has a quasi-sovereign interest "when the 'substantial impairment of the health and prosperity of the towns and cities of the state' are at stake." *Massachusetts*, 549 U.S. at 520 n.17. The NRC's unlawful regulations prevent the Arizona State Legislature from fully exercising its lawful authority to license and regulate SMRs in a manner that allows their safe deployment without unnecessary delays or permitting and hinder the development of safe and reliable nuclear power in Arizona, putting Arizonans' "'health and prosperity,'" *id.*, at risk. The Arizona State Legislature joins in Prayers for Relief A, B, and

G related to the Utilization Facility Rule, and has no objection to the other Prayers for Relief for particular private-party Plaintiffs.

G. Last Energy's Injuries

219. Plaintiff Last Energy has experienced first-hand the NRC's unusually restrictive regulatory scheme. Last Energy is a leader in the field of SMRs and microreactors. As of 2024, Last Energy has agreements to develop over 50 nuclear reactor facilities across Europe, which would produce power worth tens of billions of dollars over their lifetime. Durston, *Micro Nuclear Power: Interview with Bret Kugelmass*, *supra*. One such project in the United Kingdom would lead to nearly $400 million dollars in local investment contributing to the South Wales economy. *See US Startup Last Energy Plans Micro Nuclear Project in Wales*, Reuters, *supra*.

220. Despite Last Energy's successes elsewhere, it has reasonably concluded that constructing such plants in the United States is infeasible because of the NRC's unlawful actions. After spending $2 million on a project to manufacture nuclear reactors in Texas, Last Energy was forced to abandon the project because of prohibitive federal regulations, moving its investments to other countries. Last Energy determined the cost and time to receive a license in the United States was so radically disproportionate to the risk that it was infeasible to pursue as a small business, despite having superior technology that would benefit Texas and the rest of the United States.

221. Last Energy still desires to construct, place, and operate its non-hazardous SMRs in Texas and has taken concrete steps to do so in the event that the U.S. regulatory

framework changes. For example, Last Energy has submitted a Generator Interconnection or Modification ("GIM") application to build 30 microreactors in Haskell County, Texas for connection to the Texas grid. ERCOT accepted the application on February 18, 2025, with the power supplied expected to serve Texas's burgeoning data center industry. *See* Last Energy, Press Release, *Last Energy Announces Plan to Deploy 30 Microreactors in Texas* (Feb. 28, 2025), https://perma.cc/5HMN-BLTU. Following ERCOT's completion of a screening study—expected imminently—Last Energy and ERCOT will enter into an agreement for a Full Interconnection Study, which will include the detailed design of the connection. Last Energy also executed a binding site option agreement with the current owner on January 24, 2025, and has completed a first round of community engagement with local stakeholders and political leaders. Last Energy continues to move forward through various state and local permitting processes, but, under the current regulatory framework, will be unable to build and operate microreactors in Texas without completing NRC's burdensome, lengthy, and costly licensing process.

222. Despite the regulatory hurdles imposed by NRC, Last Energy has continued to invest in Texas with an intent to grow its nuclear footprint in the state. Last Energy participated in the Texas Advanced Nuclear Working Group established by PUCT in 2023 at Governor Abbott's direction, *see supra* ¶¶ 173–74; PUCT, Press Release, *Texas Advanced Nuclear Reactor Working Group Named* (Oct. 10, 2023), https://perma.cc/U7MC-KVTR, and is a founding member of the Texas Nuclear Alliance, an association dedicated to advancing clean, safe, reliable, and secure nuclear technology in the Lone Star State, Tex.

Nuclear All. & Last Energy, *Last Energy Joins Texas Nuclear Alliance as a Founding Member* (Feb. 5, 2025), https://perma.cc/A87C-WA4A. Last Energy has also discussed potential SMR projects at Texas military bases and other Texas locations with corporate and government representatives.

223. Last Energy has suffered extensive monetary losses in its efforts to construct and operate SMRs in the United States, all of which the NRC prevented, including expending $2 million on the abandoned Texas project described above, and will continue to suffer such injuries, given its future plans.

224. Last Energy's monetary and regulatory harms are Article III injuries. *See TransUnion*, 594 U.S. at 425; *United States v. Texas*, 599 U.S. at 676.

H. Deep Fission's Injuries

225. Like Last Energy, plaintiff Deep Fission has experienced first-hand the challenges of navigating NRC's regulatory scheme, in part because the available licensing paths do not address small reactors or deep borehole technology, but were drafted considering only traditional above-ground nuclear power plants. The result is a licensing process that is too long and too costly to support commercialization of the safe and otherwise-affordable advanced nuclear technologies under development.

226. The challenges are particularly acute for start-ups like Deep Fission, which must raise millions of dollars to meet licensing requirements that Congress has indicated should not apply to them. *See* 42 U.S.C. § 2014(cc). The funds and effort expended on meeting these requirements divert Deep Fission's resources and focus away from

microreactor development and customer engagement at a time when electricity demand is skyrocketing.

227. This costly and lengthy licensing process extends development time horizons to the edge of what is commercially viable. Worse, an ultimate denial of a license—unfortunately always a possibility—comes only after a project has been underway for years, preventing a company from bringing its reactors to market despite having invested as much as $100 million dollars on technology, business development, and licensing activities.

228. As a result, Deep Fission has begun negotiating with prospective customers, developers and partners outside the United States, in countries where the company's technology can be built on a commercially viable timeline and budget. The company has agreements in the form of NDAs, Letters of Intent, or Memorandums of Understanding, as well as negotiations in progress, in locations including Italy, the United Kingdom, South Korea, Switzerland, and the Middle East.

229. Despite the regulatory challenges, Deep Fission would prefer to build its reactors in the United States, and so has continued to pursue U.S. opportunities. For example, Deep Fission is in discussions to develop reactors that would, collectively, generate two gigawatts of nuclear energy to power data centers in the United States starting in 2029. Deep Fission also is exploring projects that would locate its unique reactors in states including Texas and Utah. Indeed, the company has demonstrated its commitment to state-side operations and working with state regulators by joining the Texas Nuclear Alliance. *See* Tex. Nuclear All., https://texasnuclearalliance.org/.

230. NRC's lengthy and costly licensing process is a hurdle to these and other projects, causing monetary and regulatory harms that are Article III injuries. *See TransUnion*, 594 U.S. at 425; *United States v. Texas*, 599 U.S. at 676.

I. Valar Atomics's Injuries

231. Like Last Energy and Deep Fission, plaintiff Valar Atomics has been forced to direct its development efforts outside the U.S. as a result of the NRC's burdensome regulatory process, launching its promising technology abroad rather than in the United States, as it would prefer.

232. Valar Atomics's reactor uses well-understood reactor design principles and low-enriched uranium, with a runtime of only one month. The combination of these parameters practically guarantees that there will be negligible fission product buildup and release at the end of the reactor life. Operational safety is aided, in part, by the strong negative feedback characteristics of the internal graphite components, as well as the low operational power density, which allows for the passive removal of decay heat.

233. Valar Atomics has actively pursued development with the United States, responding to requests for proposals and exploring siting options in both Texas and Utah, demonstrating the company's commitment to contributing to American energy infrastructure. Opportunities within these states have been promising, but the lengthy and costly NRC licensing process presents a formidable barrier to implementation. As a result, Valar Atomics has been compelled to launch its initial reactor projects in the Philippines, while its stateside projects have stalled. *See* Mike Butcher, *Valar Atomics Comes Out of*

Stealth with $19M and a Pilot Reactor Site, Tech Crunch (Feb. 20, 2025), https://perma.cc/5MH3-5SHJ. This shift has deprived Texas and Utah of potential jobs and other economic benefits, hindered technological advancement, and imposed substantial monetary losses on Valar Atomics from the stalled initiatives.

234. Despite its strong desire to construct and operate reactors in the United States, NRC's lengthy and costly licensing process is a hurdle to such projects, causing monetary and regulatory harms that are Article III injuries. *See TransUnion*, 594 U.S. at 425; *United States v. Texas*, 599 U.S. at 676.

CLAIMS FOR RELIEF

COUNT ONE

The Utilization Facility Rule Exceeds the NRC's Statutory Authority and is Not in Accordance with Law (5 U.S.C. § 706(2)(A), (C))

235. Plaintiffs incorporate by reference paragraphs 1–234.

236. Under the APA, a court must "hold unlawful and set aside agency action" that is "not in accordance with law," in excess of statutory … authority, or limitations, or short of statutory right." 5 U.S.C. § 706(2)(A), (C).

237. Defendant the NRC is an "agency" under the APA. 5 U.S.C. § 551(1); *see also* 42 U.S.C. § 2231 (the APA "shall apply to all agency action taken under this chapter").

238. The Utilization Facility Rule is a "rule" under the APA. 5 U.S.C. § 551(4).

239. The Utilization Facility Rule is a "final agency action" because it "(1) 'mark[ed] the consummation of the agency's decisionmaking process,' and is an action (2) 'by which rights or obligations have been determined, or from which legal consequences

will flow.'" *Sierra Club v. Peterson*, 228 F.3d 559, 565 (5th Cir. 2000) (en banc) (quoting *Bennett v. Spear*, 520 U.S. 154, 178 (1997)). The NRC's rule was a final rule, which bound parties seeking to build and operate utilization facilities. It is therefore subject to judicial review. *Id.*; 5 U.S.C. § 704 ("[F]inal agency action[s] for which there is no other adequate remedy in a court [is] subject to judicial review.").

240. The Utilization Facility Rule defines "utilization facility" in a manner that is contrary to the AEA.

241. The plain text of the AEA requires licensure before the construction or operation of any nuclear "utilization facility," which is defined as:

> any equipment or device, except an atomic weapon, determined by rule of the Commission to be capable of making use of special nuclear material in such *quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public*, or peculiarly adapted for making use of atomic energy in *such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public.*

42 U.S.C. § 2014(cc) (emphases added).

242. As explained above, *see supra* ¶¶ 60–79, Congress understood and intended that the AEA would lead to the exclusion of some class of reactors from licensing requirements. Certain small reactors would be "exempt from licensing as a facility, though the owner must still have a license for any special nuclear material involved," Joint Committee Report at 12, and also of course any applicable state regulations.

243. When the AEA was enacted, the AEC itself acknowledged that the new statutory text meant "to exclude from the definitions, and hence from the licensing features

of the bill, equipment or devices not capable of producing or using significant quantities of special nuclear material and not important from the public health and safety standpoint." *Hearings on S. 3323 and H.R. 8862*, *supra*, at 600; *see also* AEC, *Part IV of Draft Statement*, *supra*, at 33.

244. Despite this plain text exempting from licensing requirements certain reactors, the NRC has defined a utilization facility as "*[a]ny* nuclear reactor other than one designed or used primarily for the formation of plutonium or U-233." 10 C.F.R. § 50.2 (emphasis added).

245. But the statutory significant-quantity and public-health-and-safety limits matter, because courts and agencies must "give effect, if possible, to every clause and word of a statute, avoiding, if it may be, any construction which implies that the legislature was ignorant of the meaning of the language it employed." *Montclair v. Ramsdell*, 107 U.S. 147, 152 (1883). Statutes must be construed "so as to avoid rendering superfluous" any statutory language. *Astoria Fed. Sav. & Loan Ass'n v. Solimino*, 501 U.S. 104, 112 (1991); *see Corley v. United States*, 556 U.S. 303, 314 (2009) ("[O]ne of the most basic interpretive canons [is] that a statute should be construed so that effect is given to all its provisions, so that no part will be inoperative or superfluous, void or insignificant.") (cleaned up).

246. In addition to the plain text of the AEA, the history of the statutory definitions of "production facility" and "utilization facility" is highly relevant, because federal courts maintain a "general presumption" that, "when Congress alters the words of a statute, it must intend to change the statute's meaning." *Wilson*, 503 U.S. at 336. This

"record of *enacted* changes Congress made to the relevant statutory text over time" is "the sort of textual evidence everyone agrees can sometimes shed light on meaning." *BNSF Ry. Co. v. Loos*, 586 U.S. 310, 329 (2019) (Gorsuch, J., dissenting) (emphasis in original). The statutory change from the McMahon Act to the AEA, *see supra* ¶¶ 61–71, strongly confirms that at least *some* nuclear reactors must be below the regulatory threshold.

247. Federalism considerations also support Plaintiffs' construction of the AEA. To preserve the "proper balance between the States and the Federal Government" and enforce limits on Congress's Commerce Clause power, courts must "be certain of Congress's intent" before finding that it "legislate[d] in areas traditionally regulated by the States." *Gregory v. Ashcroft*, 501 U.S. 452, 459–460 (1991) (cleaned up).

248. Laws regulating electric utilities are squarely within a state's traditional power. *See Ark. Elec. Coop. Corp. v. Ark. Pub. Serv. Comm'n*, 461 U.S. 375, 377 (1983) ("[T]he regulation of utilities is one of the most important of the functions traditionally associated with the police power of the States."); *PG&E*, 461 U.S. at 205 ("Need for new power facilities, their economic feasibility, and rates and services, are areas that have been characteristically governed by the States."). Historically, states have made decisions about meeting their electric power needs by issuing or denying certificates of public convenience for different potential generators of power—including nuclear power plants—while balancing the comparative cost, reliability, and efficiency of various proposed sources. *See Hughes v. Talen Energy Mktg., LLC*, 578 U.S. 150, 154 (2016) (explaining that the "reserved

authority" of states under the Federal Power Act "includes control over in-state 'facilities used for the generation of electric energy'" (quoting 16 U.S.C. § 824(b)(1))).

249. Although Congress may in some instances step into the traditional domain of states, under the federalism canon, courts will only find Congress has done so if the text of the statute indicates that was Congress's "clear and manifest purpose." *Rice v. Santa Fe Elevator Corp.*, 331 U.S. 218, 230 (1947); *U.S. Forest Serv. v. Cowpasture River Pres. Ass'n*, 590 U.S. 604, 621–22 (2020) ("Congress [must] enact exceedingly clear language if it wishes to significantly alter the balance between federal and state power and the power of the Government over private property."). While the AEA indicates a "clear and manifest purpose," for *some* nuclear reactors, there is no "exceedingly clear language" that the federal government would acquire licensing authority over even the smallest reactors.

250. In the AEA, Congress expressly stated its intent to preserve the full spectrum of state authority over electric power systems: "Nothing in this [Act] shall be construed to affect the authority or regulations of any Federal, State, or local agency with respect to the generation, sale, or transmission of electric power."[8] 42 U.S.C. § 2018.

251. Instead, Congress gave the AEC—and later the NRC—the important, but carefully limited, role of regulating nuclear radiation hazards. Congress decided to require the licensing only of *significant* facilities, that is, those that the NRC has determined are

[8] The language of this provision originally ended here in 1954 with the words "electric power." An amendment a decade later added the specifying phrase, "produced through the use of nuclear facilities licensed by the Commission." Pub. L. No. 89-135, 79 Stat. 551, 551 (1965).

"capable of making use of special nuclear material in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public." 42 U.S.C. § 2014(cc).

252. In addition to the federalism canon, the NRC's facility licensing requirements implicate the major questions doctrine. Under the major questions doctrine, "in certain extraordinary cases," courts require "something more than a merely plausible textual basis for the agency action," instead requiring the agency to "point to 'clear congressional authorization' for the power it claims." *West Virginia v. EPA*, 597 U.S. 697, 723 (2022) (quoting *Util. Air Regul. Grp. v. EPA*, 573 U.S. 302, 324 (2014)). The major questions doctrine applies because of the substantial financial effects of the NRC's interpretation. *See Alliance for Fair Bd. Recruitment v. SEC*, No. 21-60626, 125 F.4th 159, 181 (5th Cir. 2024) (en banc). For example, as noted above, even a "medium"-level investment in SMRs over the next 26 years would yield "$50.6 billion in new economic output in Texas," and "$27.3 billion in income to Texas workers." Tex. Advanced Nuclear Reactor Working Grp., Deploying a World-Renowned Advanced Nuclear Industry in Texas (Nov. 2024), https://perma.cc/2ZN9-WGHL. The major-questions doctrine also applies because the NRC has intruded "into an area that is the particular domain of state law." *Alliance for Fair Bd. Recruitment*, 125 F.4th at 182.

253. If Congress wanted the NRC to have plenary authority in this area it needed to speak clearly. Instead, it has unambiguously indicated the opposite. Although the AEA grants the NRC some discretion, this discretion is not unlimited. Federal courts do not give

deference to agency decisions, but instead apply "the unremarkable, yet elemental proposition reflected by judicial practice dating back to *Marbury*: that courts decide legal questions by applying their own judgment." *Loper Bright Enters. v. Raimondo*, 603 U.S. 369, 391–92 (2024). The APA "prescribes no deferential standard for courts to employ in answering those legal questions." *Id.* at 392.

254. Under the proper reading of the statute, the NRC would still control special nuclear material through other licensing regimes. For example, even the minimal radiation hazards for smaller reactors are further mitigated by Congress's requirement that "the owner … have a license for any special nuclear material involved." Joint Committee Report at 12; 10 C.F.R. pt. 70. Users of special nuclear material would remain under the intense supervision and oversight of the NRC and would still have to maintain substantial safety requirements. *See generally* 10 C.F.R. pts. 19–21, 71–75. Moreover, the NRC's export and import controls on both special nuclear material, as well as the equipment and components of even the smallest reactors, would prevent any proliferation risk. *See id.* §§ 110.8, 110.9, 110.9a.

255. The text, statutory history, statutory context, and interpretive canons all point in one direction: the NRC has authority under the AEA to make judgments about what exactly counts as a "utilization facility," but the answer cannot simply be "everything." At least some nuclear reactors *must* fall within Congress's intentional carve-out for facilities that neither make "use of special nuclear material in such quantity as to be

of significance to the common defense and security, [nor] in such manner as to affect the health and safety of the public." 42 U.S.C. § 2014(cc).

256. On that first statutory prong, given the extraordinary supply of uranium available to the federal government, *see supra* ¶¶ 122–27, there is a strong argument that even the largest civilian nuclear reactors would not use material in sufficient amounts "to be of significance to the common defense and security," 42 U.S.C. § 2014(cc). That conclusion is inescapable for the SMRs at issue here and also for research reactors like Texas A&M's 5-Watt reactor that has a core of less than a kilogram of U-235.

257. On the second statutory prong, again not all reactors use fuel "in such manner as to affect the health and safety of the public." *Id.* Conventional nuclear power is already among the safest energy sources currently available. As the NRC and others have recognized, small, modern, and non-hazardous SMRs are even safer than older conventional reactors, and microreactors and research and test reactors are even safer still. *See supra* ¶¶ 128–53.

258. For example, as explained above, Last Energy's, Deep Fission's, and Valar Atomics's reactors have numerous passive safety features that ensure there is no meaningful risk of radiation exposure regardless of their siting, especially when viewed in the context of other regulatory regimes (such the NRC's own recognition that nuclear license holders must "conduct operations so that … [t]he total effective dose equivalent to individual members of the public from the licensed operation does not exceed … 1 mSv …

in a year," 10 C.F.R. § 20.1301(a)(1)), and in the context of everyday activities that impose noticeably higher levels of radiation. *See supra* ¶¶ 101–12, 128–53.

259. The NRC has exceeded its authority by effectively nullifying Congress's statutory command via the Utilization-Facility Rule purporting to deem all nuclear reactors as utilization facilities, without regard to whether they use "special nuclear material in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public." 42 U.S.C. § 2014(cc).

260. In short, Congress made clear that at least some reactors would fall within that carve out, but the NRC has categorically concluded that no reactor ever will. That is unlawful.

COUNT TWO

The NRC's Universalist Definition of "Utilization Facility" is Arbitrary and Capricious (5 U.S.C. § 706(2)(A))

261. Plaintiffs incorporate by reference paragraphs 1–234.

262. Under the APA, a court must "hold unlawful and set aside agency action" that is "arbitrary [or] capricious." 5 U.S.C. § 706(2)(A).

263. An agency rule is arbitrary or capricious if it fails to "examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'" *State Farm*, 463 U.S. at 43. An agency rule is also arbitrary and capricious "if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem,

offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise." *Id.*

264. "Federal administrative agencies are required to engage in reasoned decisionmaking." *Michigan v. EPA*, 576 U.S. 743, 750 (2015) (internal quotation marks omitted). "Not only must an agency's decreed result be within the scope of its lawful authority, but the process by which it reaches that result must be logical and rational." *Id.* at 750 (quoting *Allentown Mack Sales & Serv., Inc. v NLRB*, 522 U.S. 359, 374 (1998)).

265. Although agencies are entitled to deference, "the arbitrary and capricious standard of review … is by no means a rubber stamp." *United States v. Garner*, 767 F.2d 104, 116 (5th Cir. 1985).

266. Agencies have "a duty to examine" and "must justify" their "key assumptions as part of [their] affirmative burden of promulgating and explaining a nonarbitrary, non-capricious rule." *Nat. Res. Def. Council v. EPA*, 755 F.3d 1010, 1023 (D.C. Cir. 2014) (internal quotation marks omitted).

267. The AEC thus was obligated to examine its "key assumptions" that *every* nuclear facility genuinely uses "special nuclear material in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public," 42 U.S.C. § 2014(cc); *Nat. Res. Def. Council*, 755 F.3d at 1023. Moreover, as demonstrated above, the NRC's continued adherence to a universalist application of the AEA is "patently in excess of its authority." *Detroit Edison Co. v. NLRB*,

440 U.S. 301, 311 n.10 (1979). Thus, the narrowed definition of "utilization facility" was one of those "kind of clear points that an agency must consider *sua sponte*." *Advocs. for Highway & Auto Safety v. Fed. Motor Carrier Safety Admin.*, 429 F.3d 1136, 1150 (D.C. Cir. 2005).

268. Indeed, as explained above, the AEC actually recognized the precise issue of the AEA's common defense and public health and safety exception to its regulatory authority. *See, e.g.*, AEC 23/16 at 4 ("The standard is no longer whether the device is capable of producing or utilizing, but whether it is capable of producing or utilizing in such quantity as to be of significance to the common defense and security or in such manner as to affect the health and safety of the public.") (underlines in original).

269. But in its 1956 rulemaking, the AEC offered no explanation for ignoring the statutory text, nor for backtracking from its recognition that its authority had been narrowed by Congress, nor did the NRC provide any explanation for its silent assumption that all nuclear reactors are significant within the meaning of the AEA.

270. The AEC's Utilization Facility Rule therefore completely failed to "articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice[],'" *State Farm*, 463 U.S. at 43, to disregard the common defense and public health and safety exception that Congress had added.

271. That failure is even more apparent and inexcusable given that the NRC has long taken the view elsewhere that nuclear activity is not inherently unsafe, and thus that minimal thresholds for radiation exposure (measured in mSv) are appropriate.

272. For example, as explained above in greater detail, NRC regulations in existence since 1991 require that all "persons licensed by the Commission to receive, possess, use, transfer, or dispose of byproduct, source, or special nuclear material or to operate a production or utilization facility," 10 C.F.R. § 20.1002, must "conduct operations so that … [t]he total effective dose equivalent to individual members of the public from the licensed operation does not exceed … 1 mSv … in a year," *id.* § 20.1301(a)(1).

273. The NRC's 1990 Policy Statement likewise exempted a wide range of practices exposing the public to radioactive material, including releasing property to the general public, distributing "consumer products containing small amounts of radioactive material," disposing of nuclear waste not in established facilities, and recycling "slightly contaminated equipment and materials." 55 Fed. Reg. at 27,522. The NRC imposed thresholds that track human safety: the maximum allowable individual dose of radiation would be 0.1 mSv per year "for each exempted practice." *Id.* at 27522, 27527. It also established "a collective dose criterion" of "10 person-[Sv] per year" (equivalent to 10,000 persons receiving 1 mSv each, or 100,000 receiving 0.1 mSv each) as a threshold ceiling for what would be "Below Regulatory Concern." *Id.* Thus, numerous activities that involved exposing nuclear waste to the public were deemed so safe as to be entirely below regulatory concern, so long as the maximum allowable individual dose of radiation was below established levels, measured in mSv.

274. This history proves that setting safety thresholds for nuclear activities is something the NRC routinely does in highly analogous situations. Exposure thresholds

measured in mSv, for example, are thus undoubtedly workable and effective. Yet the NRC inexplicably ignored this critically important aspect, even though Congress changed the statute specifically to ensure the NRC would no longer categorize all reactors as utilization facilities.

275. By failing to provide any analysis of what class of reactors (based on size, type, configuration, use-case, radiation emissions or exposure, distance from population centers, etc.) do not use "special nuclear material in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public," 42 U.S.C. § 2014(cc), the NRC "entirely failed to consider an important aspect of the problem," *State Farm*, 463 U.S. at 43.

276. Accordingly, the Utilization Facility Rule was arbitrary and capricious and in violation of the APA.

DECLARATORY JUDGMENT

277. Plaintiffs incorporate by reference paragraphs 1–234.

278. The Declaratory Judgment Act authorizes "any court of the United States" to "declare the rights and other legal relations of any interested party seeking such declaration, whether or not further relief is or could be sought." 28 U.S.C. § 2201(a). "[A] declaratory judgment might serve as the basis for issuance of a later injunction to give effect to the declaratory judgment." *Steffel v. Thompson*, 415 U.S. 452, 461 n.11 (1974). For the reasons described above, Plaintiffs are entitled to a declaration that Defendant is violating the law and that the Utilization Facility Rule's universalist sweep—in particular its

applicability to certain small, non-hazardous reactors, such as those belonging to Plaintiffs—is in excess of the AEA's statutory authority.

PRAYER FOR RELIEF

Plaintiffs respectfully request that the Court:

A. Hold unlawful and set aside (i.e., vacate) the Utilization Facility Rule (i.e., the definition of "utilization facility") at least as applied to certain small, non-hazardous reactors, such as those operated or designed by Plaintiffs, and remand for further rulemaking consistent with the court's opinion;

B. Declare unlawful Defendant's actions in promulgating and maintaining the Utilization Facility Rule;

C. Declare the Universities' reactors exempt from the NRC's utilization-facility licensing requirements, but still subject to applicable state-level radioactive materials handling, verification, and inspection requirements, so long as their design criteria of their containment structure prevents the release of a hazardous quantity of radioactive material under any credible scenario (thus guaranteeing protection of the public);

D. Declare Last Energy's reactors exempt from the NRC's utilization-facility licensing requirements, but still subject to applicable state-level radioactive materials handling, verification, and inspection requirements, so long as their design criteria of their containment structure prevents the release of a hazardous quantity of radioactive material under any credible scenario (thus guaranteeing protection of the public);

E. Declare Deep Fission's reactors exempt from the NRC's utilization-facility licensing requirements, but still subject to applicable state-level radioactive materials handling, verification, and inspection requirements, so long as their design criteria of their containment structure prevents the release of a hazardous quantity of radioactive material under any credible scenario (thus guaranteeing protection of the public);

F. Declare Valar Atomics's reactors exempt from the NRC's utilization-facility licensing requirements, but still subject to applicable state-level radioactive materials handling, verification, and inspection requirements, so long as their design criteria of their containment structure prevents the release of a hazardous quantity of radioactive material under any credible scenario (thus guaranteeing protection of the public); and

G. Award such other relief as the Court deems equitable and just.

Dated: April 7, 2025 Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on April 7, 2025, a true and correct copy of the foregoing was filed with the Court's CM/ECF system, which will provide service to all parties who have registered with CM/ECF and filed an appearance in this action.

Dated: April 7, 2025

/s/ R. Trent McCotter
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