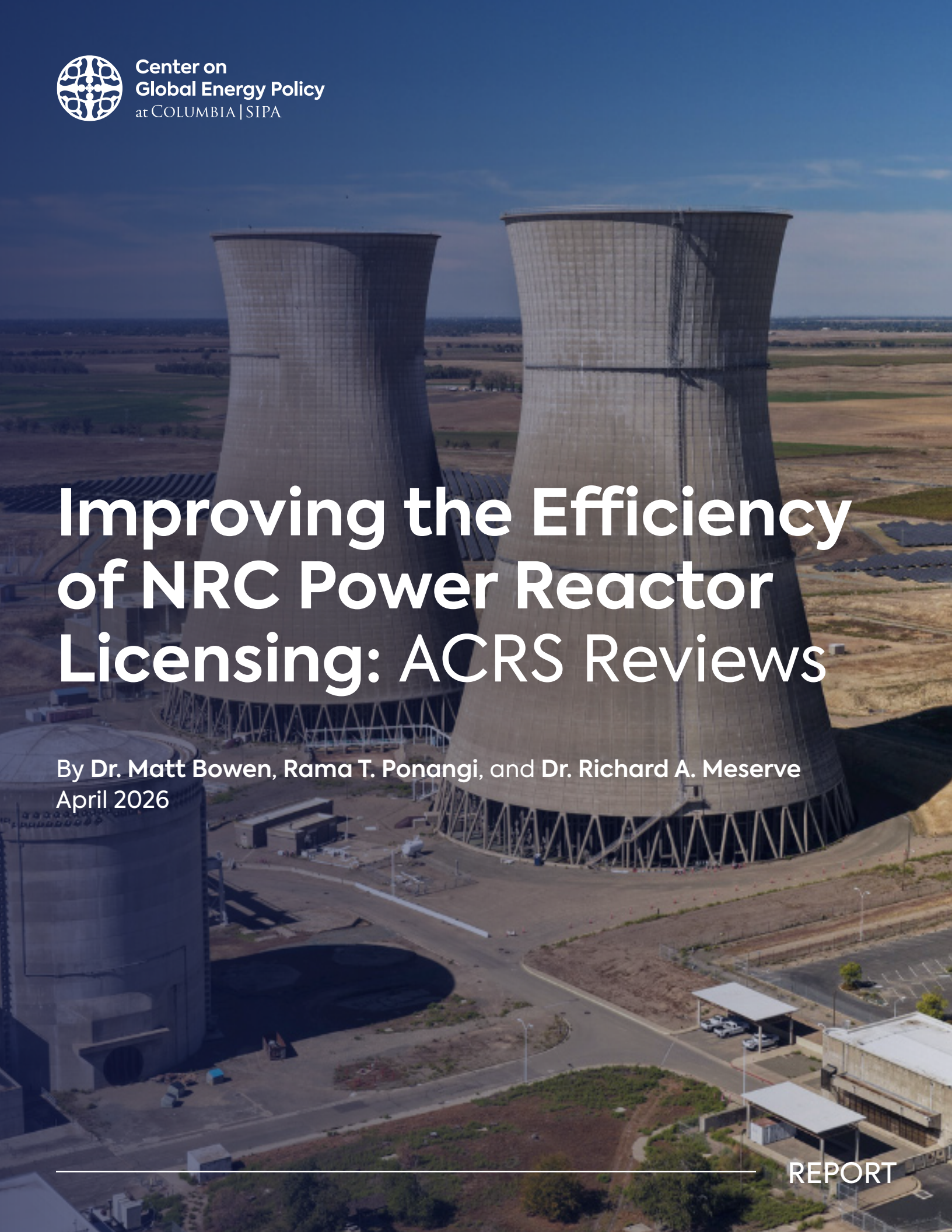


Center on
Global Energy Policy
at COLUMBIA | SIPA

Improving the Efficiency of NRC Power Reactor Licensing: ACRS Reviews

By **Dr. Matt Bowen**, **Rama T. Ponangi**, and **Dr. Richard A. Meserve**
April 2026

REPORT

About the Center on Global Energy Policy

The Center on Global Energy Policy at Columbia University SIPA advances smart, actionable and evidence-based energy and climate solutions through research, education and dialogue. Based at one of the world's top research universities, what sets CGEP apart is our ability to communicate academic research, scholarship and insights in formats and on timescales that are useful to decision makers. We bridge the gap between academic research and policy — complementing and strengthening the world-class research already underway at Columbia University, while providing support, expertise, and policy recommendations to foster stronger, evidence-based policy.

Visit us at www.energypolicy.columbia.edu

@ColumbiaUEnergy

About the School of International and Public Affairs

SIPA's mission is to empower people to serve the global public interest. Our goal is to foster economic growth, sustainable development, social progress, and democratic governance by educating public policy professionals, producing policy-related research, and conveying the results to the world. Based in New York City, with a student body that is 50 percent international and educational partners in cities around the world, SIPA is the most global of public policy schools.

For more information, please visit www.sipa.columbia.edu

For a full list of financial supporters of the Center on Global Energy Policy at Columbia University SIPA, please visit our website at www.energypolicy.columbia.edu/partners. See below a list of members that are currently in CGEP's Visionary Annual Circle. This list is updated periodically.

Corporate Partnerships

Occidental Petroleum
Tellurian

Foundations and Individual Donors

Anonymous
Anonymous
Aphorism Foundation
the bedari collective
Children's Investment Fund Foundation
David Leuschen
Mike and Sofia Segal
Kimberly and Scott Sheffield
Bernard and Anne Spitzer Charitable Trust
Ray Rothrock

Center on
Global Energy Policy
at COLUMBIA | SIPA

Improving the Efficiency of NRC Power Reactor Licensing: ACRS Reviews

By **Dr. Matt Bowen**, **Rama T. Ponangi**, and **Dr. Richard A. Meserve**
April 2026

Columbia University CGEP
1255 Amsterdam Ave.
New York, NY 10027
energypolicy.columbia.edu

@ColumbiaUEnergy

Table of Contents

Acknowledgements

This report represents the research and views of the authors. It does not necessarily represent the views of the Center on Global Energy Policy. The piece may be subject to further revision.

The Center on Global Energy Policy would like to thank the Bernard & Anne Spitzer Charitable Trust for its grant to CGEP in support of research related to nuclear energy. More information is available at https://energypolicy.columbia.edu/about/partners.

About the Author

Dr. Matt Bowen is a Senior Research Scholar at the Center on Global Energy Policy at Columbia University SIPA, focusing on nuclear energy, waste, and nonproliferation. He is also nonresident senior fellow with the Atlantic Council's Global Energy Center and a senior fellow with Good Energy Collective. He was formerly a Nuclear Policy Fellow at Clean Air Task Force and a Senior Policy Fellow at the Nuclear Innovation Alliance.

Dr. Bowen has written reports on federal and state policies to encourage advanced reactor development, and has also published papers on reforming U.S. nuclear export controls. During the Obama Administration, he was an Associate Deputy Assistant Secretary in the Office of Nuclear Energy and a Senior Advisor in the Office of Nonproliferation and Arms Control at the U.S. Department of Energy (DOE). Previous to working at DOE, he was an AAAS/APS Science Fellow for Senate Majority Leader Harry Reid.

Dr. Bowen received a Bachelor of Science degree in physics from Brown University and a Ph.D. in theoretical physics from the University of Washington, Seattle. He has held positions at the National Academies with the Board on Physics and Astronomy, the Board on Energy and Environmental Studies, and the Division on Engineering and Physical Sciences. Dr. Bowen has also done work outside of Columbia University as an independent consultant for EFI Foundation and Third Way.

Rama T. Ponangi is an India-trained lawyer specializing in nuclear law and policy. Prior to joining to CGEP, Rama worked as a Research Assistant under Professor Donna Attanasio, Director, Energy Laws, The George Washington University Law School, where he organized a 4-day conference titled "Investable Nuclear Energy" covering topics of Environment, Social and Governance aspects of nuclear energy, supply chain for the advanced nuclear reactors, future of the nuclear technology, garnering public support and role of academia in shaping next generation of nuclear law and policy experts. Rama is also a Policy Fellow at the Nuclear Innovation Alliance.

In the past, Rama interned at the Office of Legal Affairs, International Atomic Energy Agency (IAEA), Vienna, Austria, where he primarily assisted its Legislative Assistance activities such as reviewing the draft nuclear legislation of Member States and assisted in conducting bilateral and multilateral meetings such as Role of a Legal Advisor in a Regulatory Body and International Nuclear Liability Expert (INLEX). Rama also undertook research on the topic of safety, security and liability aspects of Transportable Nuclear Power Plants (TNPPs).

Rama has completed his Bachelors in Law – B.A.,LL.B. (Specializing in Energy Laws) from University of Petroleum & Energy Studies, Dehradun, India. He has completed a diploma in International

Nuclear Law from the International School of Nuclear Law (ISNL), University of Montpelier, France organized by Nuclear Energy Agency, OECD. Rama has completed his Masters in Law – LL.M. in Energy and Environmental Laws from The George Washington University Law School as GW Merit Scholar and Randolph C. Shaw Environmental Graduate Environmental Fellow. Rama has completed several other niche certifications in nuclear energy and law.

Dr. Richard A. Meserve is Senior of Counsel in the Washington, D.C. office of Covington & Burling LLP. He is President Emeritus of the Carnegie Institution for Science, having served from 2003 to 2014 after stepping down as Chairman of the U.S. Nuclear Regulatory Commission (NRC).

As Chairman of the NRC, Dr. Meserve served as the principal executive officer of the federal agency with responsibility for ensuring the public health and safety in the operation of nuclear power plants and in the usage of nuclear materials. He served as chairman under both Presidents Clinton and Bush and led the NRC in responding to the terrorism threat that came to the fore after the 9/11 attacks. Before joining the NRC, Dr. Meserve was a partner in Covington & Burling LLP. With his Harvard law degree, received in 1975, and his Ph.D. in applied physics from Stanford, awarded in 1976, he devoted his legal practice to technical issues arising at the intersection of science, law, and public policy. Early in his career, he served as legal counsel to the President's science and technology adviser, and was a law clerk to Justice Harry A. Blackmun of the United States Supreme Court and to Judge Benjamin Kaplan of the Massachusetts Supreme Judicial Court. He received his undergraduate degree from Tufts University in 1966.

Dr. Meserve has served on numerous legal and scientific committees over the years, including many established by the National Academies of Sciences, Engineering, and Medicine. He served for many years as chairman of the International Nuclear Safety Group, which is chartered by the International Atomic Energy Agency. Among other affiliations, he is a member of the American Philosophical Society, the Council on Foreign Relations, and the National Academy of Engineering; a fellow of the American Academy of Arts and Sciences, the American Association for the Advancement of Science, the American Physical Society, and the Phi Beta Kappa Society; and a Foreign Member of the Russian Academy of Sciences. Dr. Meserve formerly served on the Council and Trust of the American Academy of Arts and Sciences, on the Council of the National Academy of Engineering, and as President of the Harvard Board of Overseers. He serves on the board of TAE Technologies, Inc., the Health Effects Institute, and the EFI Foundation. He is currently serving as an external adviser to the Japanese Nuclear Regulation Authority, the regulator established after the Fukushima accident, and has received the Order of the Rising Sun, Gold and Silver Stars, from the Japanese Emperor for his service to Japan after the accident.

Executive Summary

The US government is encouraging the construction of hundreds of new nuclear reactors, including through efforts to streamline the reactor licensing process. The US Nuclear Regulatory Commission (NRC) oversees the licensing of new nuclear power plants. The longest part of this process is typically the NRC safety evaluation, which includes a review by the Advisory Committee on Reactor Safeguards (ACRS). The ACRS is an independent body established in statute by the Atomic Energy Act (AEA) of 1954 that produces integrated technical reviews of reactor projects to support public health and safety. As part of the NRC's safety evaluation, the Committee's review imposes time and cost burdens but also provides value.

This report, part of a series of publications on nuclear licensing reform at the Center on Global Energy Policy at Columbia University SIPA, analyzes ACRS reviews of new reactor licensing actions, including their length and cost to applicants. Because the AEA currently requires the ACRS to review all construction permit and operating license applications, the report also explores circumstances in which ACRS reviews may not provide significant value and might be reasonably declined.

The key findings of this research are as follows:

- The ACRS has played a valuable role in the development of US nuclear safety regulation since its establishment in statute in 1957.
- As the United States potentially undertakes deployment of reactor types that the NRC has not licensed in decades—if ever—having the ACRS examine NRC safety evaluations enhances safety and public confidence.
- ACRS reviews conducted in the past, before recent efficiency efforts, comprised about 3 to 11 percent of the total time for new reactor licensing actions. The cost of these reviews is difficult to estimate because of data limitations.
- In light of moves by the Trump administration that have broadly challenged the independence of the NRC, preserving the ACRS's independence can help protect NRC decisions from political influence.
- Going forward, some reactor applications may not benefit significantly from ACRS review, particularly those involving previously approved reactor designs.

Policy pathways for Congress and the NRC include the following:

- If Congress pursues legislative reform related to the ACRS, it should grant the Committee flexibility to decline unnecessary reviews, thereby improving efficiency, while preserving its authority to determine which matters warrant review. Congress could also steer the Committee in that legislation toward more novel and unique issues.
- The NRC could revisit some ACRS review requirements (e.g., in 10 CFR 54) to adapt to developments, such as increased licensing experience, since these requirements were first published.
- To address public data limitations and promote future research on this subject, the ACRS could provide estimates of expected charges for reviews of construction permits, operating licenses, early site permits, and combined licenses, and the NRC could disclose the amount of staff time dedicated to engaging with Committee reviews.

Introduction

Anticipating a market for low-emission, dispatchable power and heat, and supported by recent large public and private investments, many US private companies are developing a variety of nuclear reactor designs.[1] These reactors' possible role in addressing US and global energy and environmental challenges warrants evaluating the efficiency of the current US licensing regime for nuclear reactors—especially given the dearth of new reactor orders in the United States in recent decades. The bipartisan ADVANCE Act of 2024 already directed the US Nuclear Regulatory Commission (NRC) to increase licensing efficiency, among other actions, and the NRC is publicly tracking its response to the new law.[2] Making matters more challenging, the NRC will need to pursue licensing efficiency improvements in a context where many reactor designs under development are not yet operating in the United States or elsewhere and therefore present novel design features that must be evaluated for the first time.[3]

The longest single element of the NRC reactor licensing process is typically the safety evaluation. A component of this evaluation that carries both time and cost burdens, as well as significant value, is the Advisory Committee on Reactor Safeguards (ACRS) report, which follows the NRC staff's draft safety evaluation report (SER). The ACRS is an independent body established by the Atomic Energy Act (AEA) of 1954 to provide an integrated technical review of reactor projects in support of public health and safety. Composed of up to 15 technical experts from various disciplines related to reactor safety and plant operations and reporting directly to the NRC commissioners, the committee provides a transparent, public evaluation of a case's core safety issues through a top-down, holistic approach, rather than repeating the NRC's earlier, more compliance-based safety review. These evaluations take place during the roughly 10 meetings per year when the full committee is present.[4] (The ACRS holds many subcommittee meetings during the year as well.) If the issued ACRS report includes recommended actions, the NRC staff will publish a response explaining the changes they are making or why they do not think changes are warranted. In the event of a disagreement between the ACRS and NRC staff, the commission makes the final decision.

This report, part of a series on nuclear licensing reform published by the Center on Global Energy Policy, draws on congressional and NRC documents, author interviews with current and former ACRS members, author-requested information from the NRC, and governmental and nongovernmental policy proposals to examine the ACRS's role in NRC safety evaluations of new reactors. The report's main finding is that ACRS reviews have been a valuable part of the NRC's safety review process and have not significantly increased licensing times, despite claims to the contrary. That said, while ACRS reviews for new reactor applications are currently required by statute, some future

applications may not benefit significantly from such review, particularly those involving previously approved reactor designs. If Congress seeks to pursue legislation to facilitate licensing efficiency, it could delineate an option for the ACRS to decline reviews of reactor applications.

The analysis proceeds as follows: Chapter 1 explores how and why the Atomic Energy Commission (AEC; the predecessor of the NRC) created the ACRS, how Congress placed the ACRS in statute with specific duties, and its impact over subsequent decades. Chapter 2 examines the time added to NRC licensing actions for new reactors by ACRS reviews, the share of total licensing time attributable to these reviews, and the associated costs of ACRS reports. Chapter 3 evaluates recent legislative proposals to amend ACRS-related statutes and discusses the context for considering changes to the licensing process along those lines today. Chapter 4 summarizes the report's findings and offers recommendations to US policymakers.

Chapter 1: Origins and Impacts

This chapter provides an overview of Congress's statutory establishment of the ACRS and the functions assigned to the committee (see Appendix A for a more detailed account of this history). It then explores the ACRS's impact over the past roughly seven decades and its current role in NRC power reactor licensing. This serves as key context for the discussion in chapter 3 of why and how the statutes governing ACRS processes, and the nuclear licensing process more broadly, need to be reformed.

A. Origins

In 1947 the AEC established the Reactor Safeguards Committee to evaluate the health and safety aspects of reactors. Three years later it formed the Industrial Committee on Reactor Location Problems to assess the scientific and environmental aspects of reactor siting. Because the two committees addressed related issues, the AEC merged them in 1953 to form the ACRS. A licensing episode just a few years later would set in motion a series of events that led Congress to establish a statutory foundation for the committee.

The licensing episode began in January 1956, when the Power Reactor Development Company (PRDC)—a consortium of utilities that included the Detroit Edison Company—applied to the AEC to build a sodium-cooled reactor in Michigan. In an internal report, the ACRS stated that the application contained insufficient information for the committee to determine whether the reactor could be operated safely and expressed uncertainty about whether the PRDC could address these safety concerns within its proposed construction timeline and before the planned start of operations. Nevertheless, the AEC issued a conditional construction permit for the PRDC project in August 1956, which prompted the Joint Committee on Atomic Energy (JCAE), a bicameral committee with oversight of the AEC, to consider whether structural changes to the AEC reactor licensing procedures were needed. The JCAE staff report that ensued, published in 1957, argued that formalizing the ACRS's role in these procedures would benefit public safety and that this could be accomplished through a statutory amendment.[5]

Subsequent JCAE hearings on the topic that year included testimony from members of industry (e.g., insurance companies and reactor vendors) on the value of the ACRS, which they viewed as beneficial to nuclear safety. The report that emerged from these hearings, which was accompanied by a draft bill, stated that a "full, free, and frank discussion in public of the hazards involved in any particular reactor would seem to be the most certain way of assuring that the reactors will indeed be safe and that the public will be fully apprised of this fact."[6]

Congress was swayed. Later in 1957, it passed Public Law 85-256, establishing the ACRS as a statutory body. The new law tasked the ACRS with reviewing safety studies and license applications, evaluating the proposed reactor safety standards, and advising the AEC on the safety of proposed and existing reactor facilities. In an amendment to the AEA of 1954, Congress specifically required the ACRS to review all applications for commercial nuclear power plants, research and development reactors intended for industrial or commercial use, and testing facilities, in addition to other applications referred to it by the NRC. The amendment also required that these reports be part of the application record and available to the public unless they were subject to security classification.

The amendment's language was interpreted by the AEC to mean that the ACRS was also required to review amendments to reactor construction permits and operating licenses. However, Congress decided to alter this part of the law five years later based, in part, on AEC and JCAE staff studies of the AEC regulatory process. A law passed in 1962 specified that the ACRS reviews such amendments only if the commission determines it advisable. This provision remains in place today.

B. Impacts

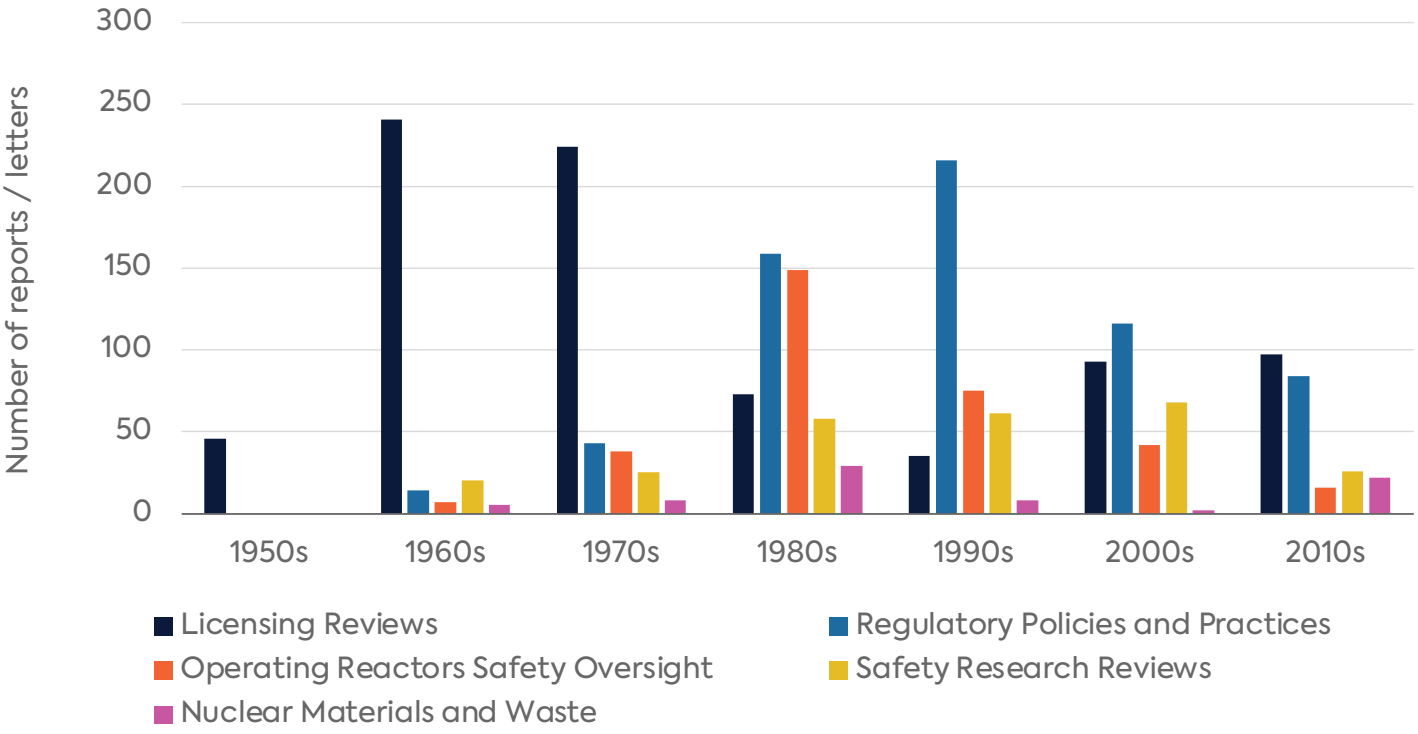
Since its statutory establishment, the ACRS has had a strong impact on US nuclear safety and development. This impact starts with ACRS reports that have led to important nuclear reactor safety and design improvements. Notable examples include the following:

- The 1959 Piqua plant: The ACRS review noted that it could not consider the novel organic-cooled reactor type project to "be without undue public hazard" unless a more substantial containment system was installed at the site; the applicant subsequently accepted this recommendation.[7]
- The 1964 Connecticut Yankee plant: The ACRS review highlighted concerns about potential control rod ejection accidents, which led to design changes for large light water reactors to avoid such scenarios.
- In 1966, the ACRS observed in a report that insufficient attention had been dedicated to emergency planning for accidents, eventually prompting an amendment to NRC regulations establishing minimum requirements for emergency plans, preparedness, and response for nuclear power plants.[8]

ACRS reports have also contributed to nuclear safety related to core meltdown accidents (particularly where emergency core cooling systems may fail), fires, operator training and human performance, digital instrumentation and control upgrades, power uprates, plant aging issues, and license renewal.[9]

Figure 1 shows the ACRS's nuclear safety focal areas across its history.

Figure 1: Number of reports or letters issued by the ACRS on various topics (1957–2017)



Source: Hossein Nourbakhsh, ACRS' Enduring Legacy Contributing to Reactor Safety, Proceedings of the 2018 26th International Conference on Nuclear Engineering (ICONE26), July 22–26, 2018.

In recent decades ACRS reviews of several project applications have also shaped new reactor designs.

Westinghouse AP1000. In March 2002 Westinghouse submitted an application to the NRC for certification of its AP1000 design. By statute (10 CFR 52.53) the NRC is required to refer any application for a standard design certification to the ACRS. The ACRS had already reviewed the Westinghouse AP600 design certification in 1998,[10] so its approach to the new design was to focus on the changes intended to accommodate the increased power level. The ACRS discussed the AP1000 over 19 meetings before concluding that most of its prior findings for the AP600 remained applicable; however, several areas related to design changes required additional analysis.[11] (The ACRS also discussed concerns raised by an academic expert at Duke University and considered one technical issue the expert identified, concluding instead that the values used by Westinghouse in the safety analysis were sufficiently conservative for design-basis evaluation, providing the public with added assurance regarding project safety.[12]) The NRC staff subsequently proposed resolutions to the ACRS's concerns,[13] and the final ACRS review concluded that all the issues raised by the committee

had been resolved and that the NRC's assessment of the AP1000's regulatory compliance was comprehensive.[14] The AP1000 design was updated accordingly. Westinghouse later submitted several applications to the NRC for approval of additional design changes,[15] and the ACRS provided feedback and identified issues that required resolution before those changes were approved.[16]

NuScale Power. In December 2016 NuScale Power tendered an application for a standard design certification for its nuclear power plant.[17] Between 2016 and 2020, the ACRS held 40 full committee and subcommittee meetings where NuScale-related topics were discussed (several of which occurred before the design certification application was submitted), and the committee would write 27 related reports.[18] The ACRS identified several focal areas for its upcoming review of the design certification application, representing potentially safety-significant issues spanning multiple chapters of the SER.[19] While the committee's 2020 safety report concluded that the design could be constructed and operated without undue risk to the health and safety of the public, it also identified several potentially risk-significant issues and requested the opportunity to reassess them in the future.

In 2022 NuScale submitted a standard design approval (SDA)[20] application to uprate its reactor module from 50 to 77 megawatt electrical. ACRS review of SDA applications is required by statute (10 CFR 52.141). In its review, the ACRS noted that NuScale had made changes to its design that addressed the risk-significant issues raised by the committee, such as boron dilution and return to criticality, and had provided a summary of testing, such as for certain valves, in the SDA application. As a result, the ACRS recommended issuing the SER and the SDA.[21]

The ACRS has also played a role in increasing transparency and public participation and confidence in the evaluation of nuclear projects, though this is difficult to quantify. Most ACRS meetings are open to the public, providing an avenue for public participation. Over the course of four recent fiscal years, for example, most ACRS meetings were open to the public (54.9 percent), with just over a third (38.4 percent) partially closed—that is, an open portion followed by a closed session to discuss "proprietary information"—and only a small fraction closed (6.7 percent).[22] Meetings may be closed to discuss classified or security-sensitive information. The openness of ACRS meetings, together with the committee's independence, is intended to bolster the credibility of final NRC safety evaluations with the public.

A recent episode is illustrative. In early 2023 the licensee of the Palisades Nuclear Plant in Michigan, which had ceased operations in May 2022, became interested in making it operational again[23]—a first for any US nuclear power plant. On September 3, 2025, the ACRS held a public meeting to deliberate the safety concerns involved, including cracks in the plant's steam generator tubes, and individuals from Michigan called in to voice their concerns.[24] After the meeting concluded, the ACRS published its report, finding that the licensee's plan for restarting the plant was sound. The report

noted, however, that the concerns unique to Palisades may have increased the incidence of stress corrosion cracking, and it advised NRC staff on how to resolve the issue.[25] The report also stated that the ACRS would monitor the plant's restart and initial operational period to ensure that its safety findings remained valid.

C. Discussion

Much has changed since Congress statutorily established the ACRS and defined its duties in 1957. After decades of regulating reactors, NRC staff—and ACRS members—are far more knowledgeable than AEC staff were in the 1950s. The NRC regulatory regime for large light water reactors has matured immensely, thanks, in part, to the ACRS. NRC staff also benefit from the accumulated worldwide experience operating and regulating (mostly water-cooled) nuclear power plants. Moreover, the NRC now provides many opportunities for the public to provide input on its decisions beyond ACRS meetings. As a result, today's ACRS reviews provide neither the drama nor impact of the PRDC episode.

Nonetheless, they still help sharpen NRC evaluations. The ACRS brings an independent eye and diverse perspectives to a process that is otherwise often siloed and compliance based. That translates to meaningful recommendations. In its FY2023 report, the ACRS noted that approximately 85 percent of its recommendations that year had been or would be fully implemented by the NRC and that the remainder had been or would be partially implemented by the NRC.[26]

Looking ahead, the ACRS's role is likely to become more important. The reactor designs being evaluated by the NRC today are unlike those already in operation in the United States. Rather than water cooled, many of the newly proposed projects use coolants such as sodium, helium, or molten salt. Nonlight water reactors present a different set of safety concerns. The current regulatory landscape is therefore not entirely unlike the early years of nuclear licensing, when NRC staff confronted complex safety issues for the first time. Then as now, the ACRS could serve as a backstop to NRC staff and help build public confidence that these safety issues are being thoroughly considered and addressed.

Chapter 2: Time and Cost Added to New Reactor Licensing

This chapter analyzes data on ACRS reviews of reactor licensing actions[27] since 2000, when applications related to new reactors started to pick up, to estimate the time and cost they added to NRC licensing.[28]

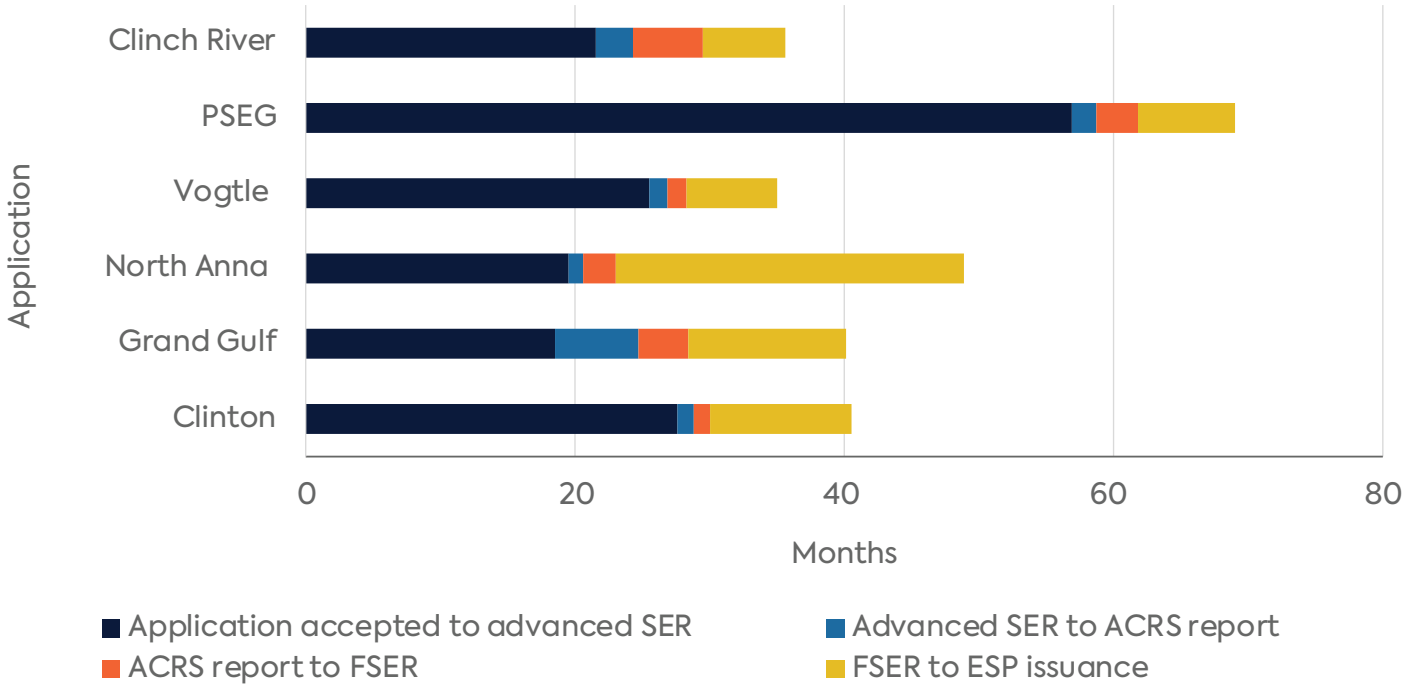
Before turning to this task, however, some context and a caveat are in order. The context is the various types of new reactor licensing actions mentioned above. NRC staff evaluate these applications and produce advanced SERs, which document the staff's safety findings. The ACRS may have already held subcommittee meetings on a given licensing action before the advanced SER is published. Afterward the ACRS holds a full committee meeting and later publishes its review, possibly raising additional safety issues and making recommendations. Once the ACRS has issued its report, NRC staff prepare and publish a final SER (FSER), which may include changes influenced or recommended by the ACRS. When the FSER and a separate environmental review of the project are completed, an adjudicatory period begins, which can involve as many as two hearings before the commission may approve the permit or license.[29]

The caveat is that significant uncertainty surrounds the estimates in this section. As discussed in greater detail below, data on the number of hours NRC staff spent preparing to engage with the ACRS at the full committee or subcommittee level, the time NRC staff spent responding to ACRS requests, and the time applicants spent on the ACRS review process do not appear to be publicly available. In some cases, applicant decisions not under the control of the ACRS lengthened the timeline. Moreover, ACRS data from a decade or more ago may not be fully representative given the committee's more recent efficiency-improvement efforts discussed in chapter 1. Nevertheless, the estimates inform the discussion in the next chapter on ways to improve the efficiency of ACRS review.

A. Time Added

Early Site Permits. Since 2000, the NRC has issued six new reactor ESPs. Figure 2 illustrates the time taken at selected stages of the licensing process for all six permits.

Figure 2: Time taken for selected stages between application acceptance and ESP issuance



Source: US Nuclear Regulatory Commission, "Early Site Permit Applications for New Reactors," last updated February 27, 2026, https://www.nrc.gov/reactors/new-reactors/large-lwr/esp.

On average, the total time from application acceptance to the NRC issuing the ESP was 45 months. The average time from application acceptance to the publication of the FSER was 33.5 months. Finally, the average time from completion of the advanced SER to the publication of the ACRS report (which could be viewed as the average minimum amount of time added to the safety evaluation process, assuming that the final SER is not published until after the ACRS report is released) was 2.4 months.[30]

Across all six ESPS, the ACRS recommended an action to the NRC staff in only one case: Grand Gulf. The recommendation stated that the NRC staff should be more explicit about the hazards associated with explosions caused by transportation accidents on the Mississippi River before

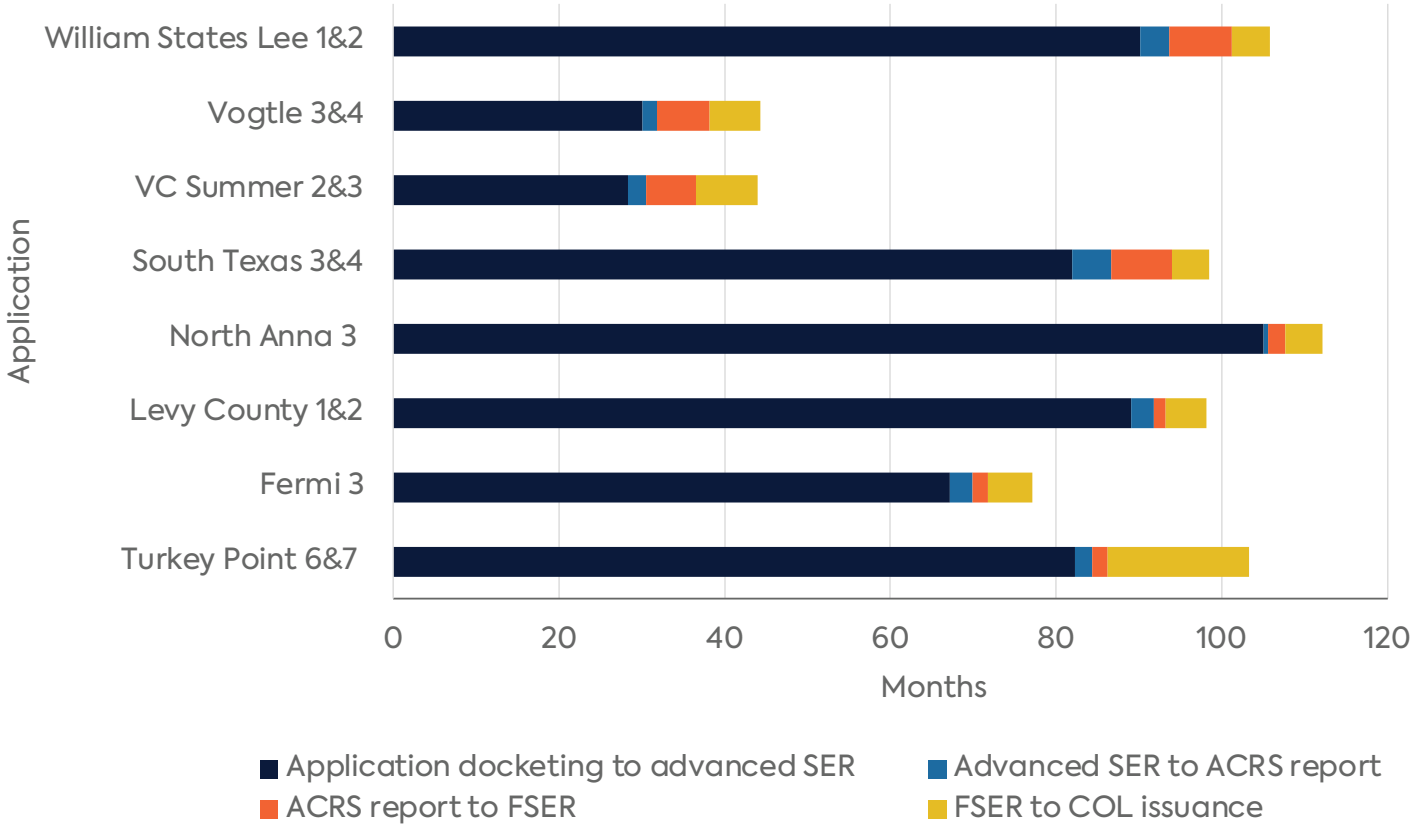
the final SER is issued. This led NRC staff to request additional information and analysis from the applicant, which was documented in the final SER.[31] In the Grand Gulf case, the time from publication of the ACRS report to issuance of the FSER—3.7 months—was longer than for most other ESPs, which required 5.2, 3.1, 1.4, 2.4, and 1.2 months, respectively (top to bottom in Figure 2; average 2.7 months). Although some of the time spent between these two milestones in the Grand Gulf case can be attributed to responding to ACRS review comments, NRC staff clearly require additional time to publish the FSER regardless of whether the ACRS has recommended an action or not.

Compared with the total licensing process, the average ACRS review took 1.6 months, or around 3.5 percent of the average total licensing time (46 months) for five of the ESPs, excluding Grand Gulf. In the latter case, which included an additional 3.7 months for NRC staff to respond to the ACRS's recommendations, the ACRS review accounted for 16 to 24 percent of the total licensing time. The ACRS review also added value by raising an issue that required additional input.

Whereas the first five ESPs each had a single subcommittee meeting lasting 4 or 8 hours on the licensing action, the last ESP—Clinch River—had five subcommittee meetings on the topic, totaling 23 hours.

Combined Licenses. Since 2000, the NRC has issued combined licenses (COLs) for eight projects. Figure 3 illustrates the time taken at the same selected stages for these projects.

Figure 3: Time taken for selected stages between application acceptance and COL issuance



Source: US Nuclear Regulatory Commission, "Combined License Applications for New Reactors," last updated March 6, 2026, https://www.nrc.gov/reactors/new-reactors/large-lwr/col.

In several cases the ACRS recommended changes to the license and associated guidance for future applications. NRC staff then responded to these recommendations by explaining how they intended to resolve the identified issues.[32]

Across the eight projects, the average time between the advanced SER and the ACRS report was 2.5 months, representing approximately 2.9 percent of the average total licensing time from application acceptance to COL issuance (85 months). NRC staff then published responses to the ACRS reports—in some cases explaining the actions they or the project developer would take to address identified issue(s) and in others simply acknowledging that the ACRS had not recommended any actions. The average time between the ACRS report and the NRC staff response was 1.4 months. An average of 10.9 months elapsed between the ACRS report and the FSER. This stage, however, was bifurcated into two groups: Turkey Point 6&7 (1.8 months), Fermi 3 (1.9 months),

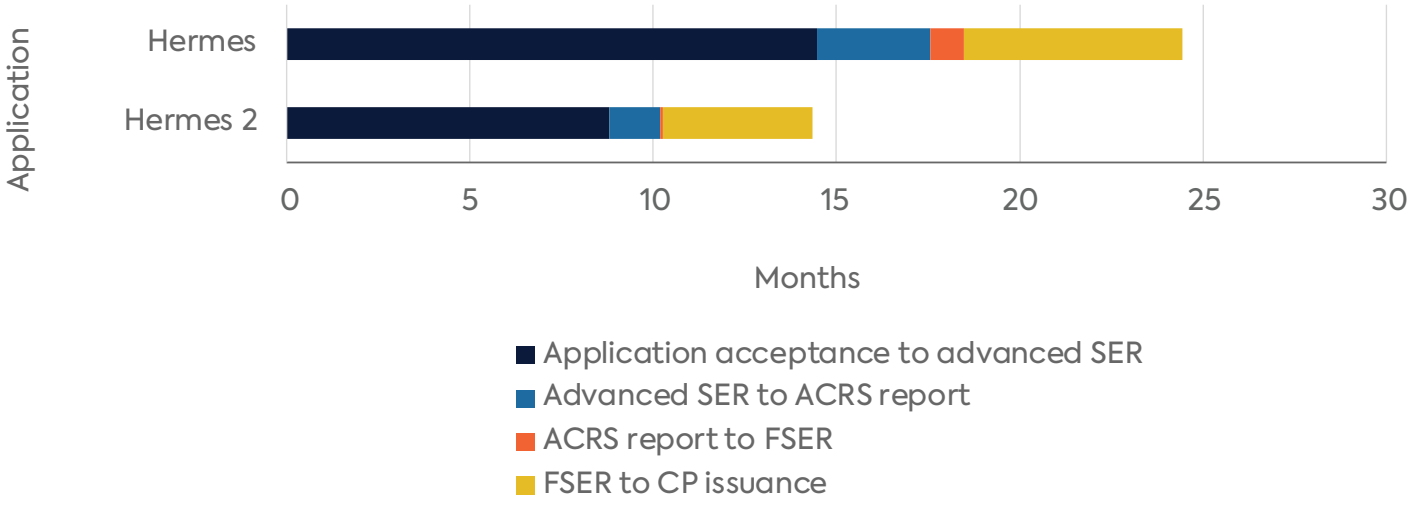
Levy 1&2 (1.4 months), and North Anna 3 (2.1 months), with an average of 1.8 months; and South Texas 3&4 (7.3 months), VC Summer 2&3 (6 months), Vogtle 3&4 (6.4 months), and William States Lee 1&2 (7.6 months), with an average of 6.8 months. This divide was not correlated with whether the ACRS recommended action.

Whereas some COLs had as few as 1 or 2 subcommittee meetings that took up 12 to 17 hours in total (North Anna, Turkey Point, William States Lee), others had as many as 22 subcommittee meetings (South Texas) that took dozens of hours combined.

Some COL licensing episodes were lengthened by applicant decisions.[33] For example, the utility for the North Anna COL, Dominion, initially applied in 2007 to build an Economic Simplified Boiling Water Reactor (ESBWR) but revised its application in 2010 to switch to US Advanced Pressurized Water Reactor technology. In 2013 Dominion revised the application again to revert to ESBWR technology, followed by another revision in 2014 in favor of an approach based on the Fermi 3 COLA.[34]

Construction Permits. The NRC recently issued two construction permits for Kairos Power's Hermes (2023) and Hermes 2 projects (2024). Figure 4 shows the time taken for selected stages of the review process from the time the applications were accepted.

Figure 4: Time taken for selected steps between application acceptance and CP issuance



Source: US Nuclear Regulatory Commission, "Hermes—Kairos Application," last updated March 3, 2025, https://www.nrc.gov/reactors/non-power/new-facility-licensing/hermes-kairos and US Nuclear Regulatory Commission, "Hermes 2—Kairos Application," last updated March 3, 2025, https://www.nrc.gov/reactors/non-power/new-facility-licensing/hermes2-kairos.html.

The two construction permits were for the same reactor design type, and the timeline from application acceptance to FSER showed a clear efficiency improvement—from 18.4 months for Hermes to 10.2 months for Hermes 2. The time from advanced SER to ACRS report likewise decreased from 3.1 months to 1.4 months. The Hermes FSER was published 0.9 months after the ACRS report, whereas the Hermes 2 FSER was completed only two days after the ACRS report. The ACRS reviews for both construction permits noted novel and unique aspects of the reactor design and related issues that would need to be addressed at the operating license application stage, potentially making that stage more efficient, before recommending that the construction permits be issued without any changes to the SER. The time from the advanced SER to the ACRS report for Hermes and Hermes 2 was 12.7 percent and 9.8 percent, respectively, of the total time from application acceptance to issuance of the construction permit.[35] Hermes had five subcommittee meetings totaling approximately 53 hours, while Hermes 2 had three subcommittee meetings that collectively took about 19 hours.

B. Costs

In addition to time, ACRS reviews also add cost to NRC licensing of new reactors. However, the ACRS only publishes total operating costs, not the cost of individual reviews. Instead of charging its costs to individual licensees or applicants, the ACRS charges to NRC business lines (e.g., operating reactors and new reactors) that are part of the agency's overall budget. Publicly accessible data on the cost of individual ACRS reviews of new reactor licensing actions is not available.[36]

Table 1 shows the ACRS's total operating costs for four fiscal years and relevant operational statistics.

Table 1: ACRS costs and related operational statistics for four fiscal years

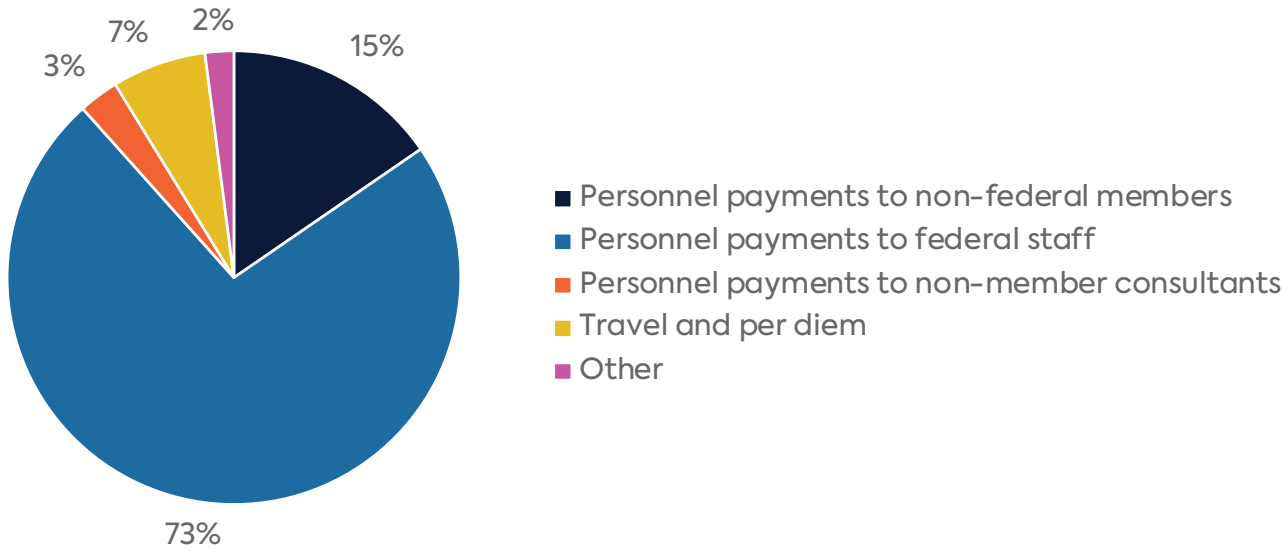
Fiscal Year	Number of full committee meetings	Number of subcommittee meetings	Number of committee members	Number of reports	Federal staff full-time equivalent	Cost
2023	10	47	12	22	23	$5.4M
2020	12	43	10	30	25	$5.5M
2017	10	62	14	29	30	$6.3M
2014	10	61	14	30	33	$6.0M

Source: NRC website.[37]

Dividing the costs shown in Table 1 by the number of reports each year, the average report over the four fiscal years is estimated to cost between $183,000 and $245,000. However, the reviews undertaken in this time frame varied greatly in terms of staff hours involved. For example, whereas the review of a design certification could involve dozens of meetings and hundreds of hours,[38] the review of a topical report could require only one subcommittee meeting and one full committee meeting.[39]

Figure 5 shows a breakdown of the $5.4 million in ACRS operating costs for FY2023.

Figure 5: Breakdown of $5.4M in costs for FY2023



Note: "Other" includes rents, user charges, graphics, printing, mail, and related costs. The "travel and per diem" costs combine those for nonfederal members, federal staff, and nonmember consultants.
Source: US Nuclear Regulatory Commission, 2023 Fiscal Year Report: Advisory Committee on Reactor Safeguards, February 22, 2024, https://www.nrc.gov/docs/ML2405/ML24053A360.pdf.

The two largest costs in the ACRS budget are for federal staff and nonfederal members. In FY2023 the former cost $3,957,000 (or an average of $172,000 per FTE) and the latter $836,000 (or an average of $70,000 per member).[40] Members of the ACRS are classified as special government employees and are therefore limited to 130 workdays in a 365-day period.

Similar to the earlier time estimates, these cost figures exclude important variables—namely, costs incurred by NRC staff or applicants to engage with the ACRS (e.g., preparing for and participating in meetings, answering ACRS questions, responding to ACRS comments). These costs may be as much as, if not greater than, the direct costs in the ACRS operating budget.

Summary

This analysis of ACRS ESP and COL reviews shows that the average time spent on them, including NRC responses, is only a small portion of the total average licensing duration (5.3 percent and 2.9 percent, respectively). The time dedicated to reviewing CPs (11.3 percent) is longer, but the two existing examples of such reviews are widely viewed as having been efficient. In cases where the ACRS requested action from the NRC, additional time could fairly be ascribed to the ACRS review. However, that amount is unlikely to be the equivalent of the total time from the ACRS report to the FSER publication since cases where the ACRS did not make a recommendation often took nearly or just as long.

The ACRS itself has emphasized the need for increased efficiency in areas such as the topical report and safety review process and preparation for nth-of-a-kind reviews.[41] It has also taken practical efficiency-enhancing measures. For example, after reviewing eight license renewal applications, the ACRS decided to eliminate the subcommittee meeting that preceded full committee consideration and to shorten the length of that consideration for renewals, thereby reducing applicant and NRC staff interaction time with the ACRS by two-thirds. The ACRS also allowed the applicant to participate virtually in the full committee meeting, reducing travel time.[42]

The ACRS budget is mostly taken up by NRC employees, not ACRS members, who are part-time special government employees. Members bring extensive experience and expertise to the NRC at limited cost.

As an order-of-magnitude benchmark, the authors used data on total ACRS operating costs over four fiscal years to estimate an average cost per review of $183,000 to $245,000. This is only a general estimate, however; it is not specific to review types, some of which are more time intensive and thus likely costlier than others. Moreover, the data on which it is based derive from before the ACRS undertook its efficiency improvements.

These time and cost estimates do not include the resources incurred by applicants—that is, for the applicant's staff time and travel—to prepare for and take part in ACRS reviews, which are not publicly known. They also do not include the costs associated with NRC staff engagement, which are charged back to applicants, as these costs are also not publicly known.[43] In some cases, these costs may be more burdensome than the direct costs of paying for the ACRS operations.

The overall picture from the data is that ACRS reviews do not take up a significant portion of the total time needed for NRC new reactor licensing actions. The cost is harder to estimate given the data limitations noted above.

Chapter 3: Legislative Proposals to Reform the ACRS

The 1962 amendments to ACRS-related statutes of the AEA of 1954 discussed in chapter 1 remain the last substantial ones of their kind. This does not mean, however, that there have been no proposals. In the early 1970s, the NRC was receiving far more new reactor applications than in the past and was seeking ways to streamline their review without compromising safety. The AEC sent Congress a proposal (introduced as HR.13484 in 1974) that would remove the statutory requirement in Section 182b of the AEA that the ACRS review every construction permit and operating license application and would authorize the AEC commissioners to decide whether an ACRS review should be undertaken. In the NRC's first year of existence (1975), it sent a different proposal to Congress (introduced by members of Congress as S.1717/HR.7002) that would similarly remove the requirement in Section 182 but gave the ACRS the discretion to determine whether a review should be conducted.[44]

These early proposals, though not adopted, framed an important contour of debate over ACRS reform. More recent policy proposals have likewise focused on removing the review requirement in Section 182b and on determining who should have the authority to decide when an ACRS review is necessary. This chapter reviews these proposals and makes a case that this authority properly rests with the ACRS, not the commission.

A. Recent Policy Reports

Recent proposals to amend ACRS-related provisions of the AEA of 1954 include the following:

- The Nuclear Innovation Alliance (NIA) recommended that Congress amend the AEA of 1954 to remove the ACRS review requirement for all construction permit and operating license applications, including renewals, and instead specify that the ACRS review only novel and safety-significant issues as directed by the NRC.[45]
- The Idaho National Laboratory (INL) recommended removing Section 182b of the AEA of 1954 and modifying the language in Section 29 to specify that ACRS reviews address only "safety studies and facility license applications referred to it."[46]
- The Nuclear Energy Institute (NEI) recommended changing the AEA of 1954 to eliminate ACRS review of COLAs for already approved standard plant designs.[47]

- The Energy Innovation Reform Project (EIRP) and Center for the National Interest (CNI) jointly recommended that Congress amend the AEA of 1954 to limit ACRS review to checking "new and novel applications only."[48]

Members of Congress have also introduced legislation to revise the ACRS's structure and review obligations.

- The "Nuclear Advisory Committee Reform Act" discussion draft would amend Section 182b of the AEA such that the ACRS would review only applications that the NRC specifically refers to it.[49]
- The ACRS Reform Act of 2024 would limit ACRS review to applications that present novel issues or significant safety concerns based on a risk-informed determination by the NRC.[50]

B. Discussion

The NIA and INL proposals both recommend removing the statutory requirement for the ACRS to review all construction permit and operating license applications and leaving the decision about whether the ACRS should review a given application to the NRC. (The latter is not stated explicitly in the INL proposal, but it is likely intended given that the ACRS reports to the NRC.) The INL proposal would also eliminate—intentionally or not—the requirement that ACRS reviews of construction permit and operating license applications be made public.

The NEI proposal is, in some ways, narrower than the NIA/INL proposals—eliminating ACRS reviews only for applications for a combined license under part 52 where the design has already been approved by the NRC (in which case the design itself would already have been reviewed by the ACRS). On the other hand, the word "eliminate" could be interpreted to mean "prohibit," whereas the INL/NIA proposals merely eliminate the *requirement* for an ACRS review, leaving the determination of whether an ACRS review is needed to the NRC. It is worth noting that NRC regulations[51] already state that for multiple combined license applications referencing a common design, the ACRS should not reevaluate the design each time but instead assess only the issues specific to each application (e.g., siting). The NEI proposal states that ACRS reviews are "lengthy" and "often redundant to [NRC] staff reviews, representing a high administrative burden on the industry for low safety value."

The EIRP/CNI proposal does not identify how or by whom applications would be determined to meet the "new and novel applications only" criterion.

Putting the latter proposal aside, the remainder would seem to empower the commissioners to determine which applications the ACRS should review once the statutory requirement for the ACRS to review every construction permit and operating license application is lifted. This poses

several concerns. First, the commissioners do not possess the breadth of technical expertise and experience reflected in the ACRS and are therefore less well positioned to assess the significance of the issues presented by an application. Their determination would likely be influenced by input from the technical staff, who might prefer to avoid any examination of their analysis by the ACRS.

Second, the very recent context of the Trump administration's broad challenge to the independence of the NRC exists. The administration's Executive Order (EO) 14215 from February 2025 subjected the actions of US agencies, including the NRC, to review by the White House for consistency with the president's priorities.[52] Of particular relevance to the ACRS, the regulatory review process conducted under the EO may affect the committee's access to draft rule text, as new limitations restrict the public sharing of rulemaking information. Because the ACRS reviews safety standards pursuant to the AEA of 1954 and must operate in the sunshine under FACA (absent a legally supportable reason to close the meeting and withhold the rule text), the confidentiality requirements imposed by the EO may be inconsistent with ACRS review.

In addition, the Trump administration has pushed out NRC senior career staff and fired NRC Commissioner Christopher Hanson (chairman of the NRC under the Biden administration) without cause. This has raised the specter of additional firings should the NRC reach decisions that the White House perceives to be inconsistent with its priorities. Commissioners have testified in congressional hearings that they are concerned about this possibility.[53]

The White House also issued EO 14300 in May 2025, which focused on the NRC and included numerous directions to the agency, including, in effect, substituting Department of Energy (DOE) or Department of Defense risk assessment of commercial reactors for NRC evaluations in some circumstances.[54] Following that EO, a Trump administration staffer reportedly told the NRC to "rubber stamp" subsequent reactor licensing applications where a reactor design had been previously licensed by the DOE.[55] Under questioning by Congress on this matter, NRC Chair David Wright confirmed the statement had been made but said he pushed back at the time and asserted the NRC would not rubber-stamp such designs.[56] (Some of the concerns regarding this DOE-NRC arrangement could be ameliorated if the NRC participated actively in the DOE licensing process, as opposed to merely observing it.)

The EO also mandates that ACRS personnel and functions be reduced to the minimum necessary to fulfill ACRS's statutory obligations and that ACRS reviews of permitting and licensing issues focus only on those that are truly novel and noteworthy (without explaining how and by whom this determination should be made).

These actions by the Trump administration are unprecedented. Previous administrations, including the first Trump administration, respected the independence of the country's nuclear safety

regulator, understanding it as vital to ensuring public safety (and public confidence in nuclear power), as outlined by the US National Academies of Sciences, Engineering, and Medicine and the International Atomic Energy Agency.[57]

The undermining of the NRC's independence makes this moment a precarious one for considering statutory changes to NRC power reactor licensing safety evaluations.[58] If the AEA of 1954 were amended to remove the ACRS review requirement and the decision were left to the NRC commissioners (or perhaps, in effect, the White House), ACRS reviews could be greatly reduced, if not eliminated entirely, even in cases where the committee should be involved based on the specifics of the application. The White House's EO states that the functions of the committee "shall be reduced to the minimum necessary to fulfill ACRS's statutory obligations," but if ACA Section 182b were eliminated, for example, the ACRS would no longer be obligated by statute to review any new applications for construction permits or operating licenses.

Chapter 4: Conclusions and Recommendations

The NRC is widely viewed as the international gold standard for nuclear safety, and ACRS reviews are integral to its processes. The nuclear energy landscape in the United States has changed immensely since the ACRS was put into statute in the 1950s, and the nature and scope of ACRS reviews should evolve with it. This report has focused on legislative proposals to reform ACRS reviews of new reactor licensing, but other aspects of the ACRS's functions are surely worthy of consideration too. For example, the NRC could revisit the ACRS review requirement in 10 CFR 54 for reactor relicensing (see Appendix B for more details on this proposal).

As the United States potentially undertakes deployment of reactor types that the NRC has not licensed in decades—if ever—having an independent group of technical experts examining NRC safety evaluations and producing an integrated review enhances safety and public confidence. If the ACRS is to continue fulfilling this function, the NRC will need to continue recruiting members with top credentials and a broad spectrum of knowledge.

For subsequent deployments of a certified reactor design, there may be project- or site-specific issues that warrant ACRS attention. Explicitly giving the ACRS flexibility to decline reviews associated with new reactor licensing could speed up new reactor licensing actions in the future, though based on the data reviewed in chapter 2, perhaps only by 3 to 11 percent. While some have claimed that ACRS review is burdensome and takes up significant time, the available data seems to suggest otherwise, and the ACRS has made efforts to become even more efficient.

Not having an ACRS review would surely reduce direct licensing costs—likely by hundreds of thousands to millions of dollars—as well as the applicant staff time and travel and NRC staff time required to prepare for and participate in ACRS meetings and respond to ACRS comments. For transparency and to clear up misconceptions, it would be helpful for the ACRS to provide estimates of charges for future reviews of construction permits, operating licenses, early site permits, and combined licenses. If the NRC possesses the relevant data, it would similarly be helpful for it to disclose how much NRC staff time has been charged to prepare for, participate in, and respond to ACRS reviews of these licensing actions.

Although there are costs, ACRS reviews provide significant benefits as well. Applicants may not want to field safety questions on their designs in a public forum—and similarly some NRC staff may not want their work publicly cross-examined—but such public peer review is valuable not just for safe

nuclear operations but also for public confidence that reactor projects will be safe. For that reason, a more conservative, evolutionary approach to ACRS reform is most sensible.

Given the context described in chapter 3, preserving the ACRS's independence can provide some protection against the prospect of NRC decisions being influenced by political considerations. If a legislative reform is pursued, an approach similar to the NRC proposal (S.1717/HR.7002) to Congress in 1975 could give the committee the flexibility to decline unnecessary reviews while preserving its authority to determine which matters warrant review.[59] Congress could also steer the committee toward more novel and unique issues. If this approach made its way into law, the NRC could consider developing an internal process whereby NRC staff and the ACRS meet (earlier than the ACRS typically begins its reviews) to discuss whether an ACRS review would be a good use of resources.[60] Crucially, as part of preserving its independence, the ACRS must have the final say on whether it reviews a given reactor proceeding.

Given the ACRS's likely continued role in ensuring that safety is the guiding star for regulatory decisions, it will also be important to ensure that the ACRS membership is made up of individuals with independence, integrity, and technical expertise. This requires the commission to protect its authority over ACRS membership, which also helps to ensure ACRS independence from political interference. It will likewise be important that the ACRS be composed of individuals who collectively represent the range of technical expertise needed to address the matters that come before the committee in review. This, in turn, requires that membership not be reduced so significantly that the scope of the committee's technical expertise is diminished.

In the long run, the committee's workload should not be constrained by statute. If the United States ever finds itself in a position where the NRC is evaluating applications for the same reactor design, it will likely not be a good use of ACRS resources to review every construction permit or operating license application with that design. On the other hand, the ACRS should be allowed to determine the matters of safety significance that warrant its examination.

Appendix A: Origins and Statutory Changes

This appendix provides a detailed account of how the ACRS was created and why Congress felt the need to establish it in statute.

A. The AEC's Creation of the ACRS

In 1947 the Atomic Energy Commission (AEC)—the predecessor of the Nuclear Regulatory Commission (NRC)—established a blue-ribbon advisory group called the Reactor Safeguards Committee. Composed of leading US atomic experts and chaired by physicist Edward Teller, the committee was tasked with "evaluat[ing] the technical health and safety aspects of reactor hazards"[61] and providing recommendations to the AEC's general manager. In reflecting later on the committee's early role, Teller, who led it for six years, said, "The committee was about as popular—and also as necessary—as a traffic cop."[62]

In 1950 the AEC expanded its safety oversight by creating the Industrial Committee on Reactor Location Problems, which it tasked with assessing "the scientific and environmental aspects involved of reactor locations."[63] The new committee included members with wide-ranging scientific and industrial backgrounds. Among its responsibilities was reviewing siting issues for specific government reactors, including nearby population density, property values, and hydrological and seismic factors.[64] Given that the responsibilities of these two groups were interrelated, the AEC merged them in July 1953 to form the Advisory Committee on Reactor Safeguards (ACRS).

B. The PRDC Controversy

In January 1956 the Power Reactor Development Company (PRDC)—a consortium of utilities that included the Detroit Edison Company—submitted an application to the AEC to construct a fast breeder reactor. As part of its review of the application, the ACRS stated in an internal report to the AEC that "insufficient information [is] available at this time to give assurance that the PRDC reactor can be operated at this site without public hazard."[65] The committee expressed uncertainty about whether its concerns could be addressed within the timeline proposed by PRDC and recommended that the AEC expand its experimental breeder reactor programs to gather additional data.[66]

At the time ACRS reports were not required to be made public, but one commissioner, Thomas E. Murray, felt compelled to share the ACRS's conclusions with the Joint Committee on Atomic Energy

(JCAE).[67] Members of the JCAE were upset not only about the safety implications but also about the AEC's failure to keep the committee "fully and currently informed" about its activities, as mandated by the AEA of 1954.[68]

In response the JCAE demanded access to the ACRS report. The AEC resisted, arguing that the ACRS assessment was predecisional and therefore not subject to public disclosure. After extended discussions, the AEC agreed to provide the report only if the JCAE would treat it as administratively confidential. The committee declined to accept these terms. The AEC also denied Michigan Governor G. Mennen Williams's request for the report, stating that it would be inappropriate to disclose the contents of internal documents.

After the PRDC agreed to conduct tests to address the issues identified by the ACRS, the AEC recommended approval of a construction permit despite the outstanding safety concerns. On August 2, 1956, the AEC voted three to one in favor of issuing the permit, with Commissioner Murray casting the sole dissenting vote. To reflect the ACRS's concerns, the AEC labeled the permit as "conditional," emphasizing that the company would need to resolve the outstanding safety concerns before the operating license could be granted.[69]

The AEC's decision was received unfavorably by the JCAE and Michigan labor unions, with the unions challenging the construction permit by filing a petition to intervene in the proceedings and requesting a public hearing.[70]

C. JCAE Staff 1957 Report on AEC Regulatory Processes

Although the unions' efforts ultimately failed to halt construction of the PRDC reactor, the JCAE took action to prevent such an episode from recurring. Senator Anderson ordered the JCAE staff to prepare a study of the AEC's licensing procedures and regulatory organization focused on three policy-related items: (1) conducting public hearings before the AEC grants or denies a construction permit, (2) requiring all reports on reactor safety be made public as soon as completed, and (3) separating the AEC's regulatory functions from its developmental and promotional functions.[71]

The published JCAE study examined, for example, whether making public the safety analysis conducted by a body of experts independent of AEC staff would provide additional safety protection and whether it could serve as a temporary device during this period of experimental development. The report stated that the ACRS and its predecessors had played a historically significant role since 1947 in providing expert guidance to the commission. It also explored whether the ACRS's independent review function should be formalized in statute and whether its reports should be published as part of the reactor licensing process. The JCAE staff argued that formalizing

the ACRS's role in licensing proceedings would benefit public safety. They also noted that the insurance industry had assessed the ACRS's continued existence as an "integral component" for private insurance to support the success of the reactor industry.[72]

The JCAE staff observed that the ACRS had historically prepared reports for the AEC on major construction permit applications without impacting their working relationship. They also pointed out that applications for large-scale reactors or reactors of new design were unlikely to become so numerous in the near future to demand a much greater percentage of the committee's time. They even added that if the number of applications did increase, other staff could share the workload.[73]

The JCAE staff thought that if the AEC valued the ACRS's evaluations, it would be equally important to make them accessible to the public. One of the AEC's objections to this idea was that it might discourage the ACRS from offering candid advice to the commission. The JCAE staff report rejected this concern, however, arguing that it was unreasonable to assume that the committee would alter the substance of its findings merely because the reports would be made public. On the contrary, the report noted that, in the event of a hearing, published reports could provide a proper foundation for cross-examination on relevant issues. In conclusion, the staff stated that "if continued reliance were to be placed on the appraisal of power reactor facilities by the ACRS, it might well be made a special statutory committee by amendment to the Act defining its composition and functions and defining the occasions on which an application should be reviewed by the Committee and a public report issued."[74]

D. Public Law 85-256

On March 21, 1957, Senator Clinton Anderson introduced S. 1684 (85th Congress, 1st session), a bill to amend the AEA of 1954 procedures for facility license applications. In his accompanying statement, Senator Anderson emphasized that the AEC would be required to adopt key procedural changes aimed at enhancing "public knowledge of reactor safety problems and control" and ensuring "fair and impartial administrative actions on applications."[75] The amendments included three key provisions concerning ACRS and reactor licensing: (1) formally establishing ACRS as a statutory body; (2) requiring the ACRS to review certain reactor applications and mandating that its reports be made public, except in cases involving classified information; and (3) directing the AEC to hold public hearings on permit or license applications for the construction and operation of certain type of reactors, with at least 30 days' advance notice.[76]

On ACRS specifically, Senator Anderson remarked that it "is a group which holds and deserves public respect, and its advice is eagerly sought by many people, including members of the insurance industry [a reference to the broader legislative discussion over nuclear liability and the

Price-Anderson Act] who are becoming aware of atomic-energy hazards." He stated that the increased workload from the proposed legislation would not hinder the effectiveness of either the ACRS or the AEC and that the public importance of these provisions warranted their adoption.[77]

The JCAE held hearings on March 25, 26, and 27, 1957, on the bills S. 715 and H.R. 1981 introduced by Senator Clinton Anderson and Representative Melvin Price—collectively known today as the Price-Anderson Act. The hearings focused on indemnity against reactors hazards.[78] Various individuals opined on S. 1684 and specifically the ACRS provisions, offering differing views. Charles J. Haugh, vice president of Liberty Mutual Insurance Co., remarked that the ACRS performed "an extremely useful function" and should continue to exist and noted that S. 1684 would ensure this.[79] Francis T. McCune, president of the General Electric Co.'s atomics products division, supported a formal status for the ACRS and favored publishing the reports. He cautioned, however, that the precise roles of ACRS and commission staff would need to be carefully considered.[80] Hubert W. Yount, vice president of Liberty Mutual Insurance Co., supported the continuance of a strong impartial committee and the objectives of the bill. However, he expressed concern that making ACRS reports public might discourage people from serving on the committee, as the reports could potentially become a matter of public controversy.[81] The American Public Power Association argued that AEC reactor hazard reports and ACRS reports should be made public. It also emphasized the need for an independent group to provide objective, disinterested, and expert evaluations so that residents of affected communities and states could make an informed judgment on the safety of nuclear energy projects. Additionally, it pointed to the PRDC case as a demonstrative example of why ACRS reports should be made public. It also assessed the AEC's opposition to publishing committee reports as reflecting a "paternalistic philosophy" inappropriate for public administration in a democratic society.[82]

In May 1957 the JCAE recommended the passage of the indemnity bill (S. 2051/H.R. 7383), including the provisions of S. 1684/H.R. 6604. The JCAE justified the inclusion of these provisions by stating that "Congress should . . . provide all possible statutory requirements for assuring that reactors should be as safe as possible."[83] The JCAE report accompanying H.R. 7383 noted that while the AEA of 1954 contained over 18 references to health and safety requirements, it did not establish a body specifically tasked with reviewing and advising on the health and safety aspects of licensed operations. The committee therefore found it desirable to formally establish such a body and incorporated the relevant provisions of S.1684/H.R. 6604 into Sections 4, 5, and 6 of the indemnity bill. The JCAE required that ACRS reports be made public, stating that "full free, and frank discussion in public of the hazards involved in any particular reactor would seem to be the most certain way of assuring that the reactors will indeed be safe and that the public will be fully apprised of this fact."[84]

Public Law 85-256 established a statutory framework for the ACRS and authorized up to 15 members to be appointed for four-year terms.[85] The new Section 29 of the AEA of 1954, as amended,

tasked the ACRS with reviewing safety studies and license applications, evaluating proposed reactor safety standards, and advising the AEC on any hazards of proposed and existing reactor facilities. Congress also created Section 182b, which stated, "The Advisory Committee on Reactor Safeguards shall review each application under section 103 or 104 b. for a license for a facility, any application under section 104 c. for a testing facility, and any application under section 104 a. or c. specifically referred to it by the Commission, and shall submit a report thereon, which shall be made part of the record of the application and available to the public, except to the extent that security classification prevents disclosure." Accordingly, new applications would be reviewed by the ACRS, as would all proposed modifications to existing licenses.

However, concerns about the AEC's dual role as promoter and regulator of nuclear power persisted, raising doubts about the adequacy of its oversight structure. Simultaneously, the growing number of reactor applications placed increasing strain on the licensing process—particularly on the ACRS, which, under the 1957 amendment, was required to review every license application and amendment. The hearings process also came under scrutiny, as mandatory hearings under section 189a were conducted at both the construction permit and operating license stages, adding to delays. These issues led to another JCAE staff study on AEC regulatory processes and eventually to additional reforms.

E. 1961 Staff Studies by the JCAE and the AEC

In 1960 Senator Anderson commissioned a follow-up to the 1957 JCAE staff study focusing on the increasing workload of the AEC and the ACRS, as well as the AEC's dual mandate (i.e., promotion and regulation).[86] AEC staff also conducted and published a study on AEC regulatory processes.

AEC Staff Study

Titled *Report on the Regulatory Program of the Atomic Energy Commission*, the AEC study suggested, among other changes, several modifications to the ACRS's role in the AEC regulatory process.[87] The first of these was to define the role of the ACRS in statute so that all the stakeholders "have a better understanding of the functions which the Committee performs as contrasted with those of the hazards evaluation staff and hearing examiner, and of the role of the Committee as technical advisers to the Commission."[88]

The second—a recognition that the ACRS was composed of experts with primary duties outside the committee, whose time and energy should not be overburdened, and that the AEC's safety evaluation staff had become more mature and capable—was to limit the ACRS's workload to only

the most significant or novel reactor cases. It was also intended to focus to broad principles of safety rather than detailed case-by-case technical reviews.

The third was to start the ACRS assessment only after the hazards evaluation staff completed its review and submitted an analysis. While this would initially increase the review time, the staff believed that it would ultimately make the process more efficient.

The fourth was to amend Section 182b of the AEA of 1954, which requires the ACRS to review all reactor license applications, to waive the ACRS review requirement in cases where the staff determined no substantial new safety issues were involved.

The fifth was that ACRS rely primarily on the hazards evaluation staff as its information source and for consultant input while limiting applicant presentations to clarifications only. The staff emphasized that this would keep the ACRS's work aligned with its statutory role under Section 29 as an advisory body, evaluating information developed by the staff, and help streamline the review process.

The sixth and final suggested modification proposed that formal communications on reactor status continue to be directed to the chairman, while ongoing liaison with the commission on policy matters be conducted primarily through the director of regulation, with direct contact with the commissioners as appropriate.[89]

JCAE Staff Study

The JCAE staff study examined the broad scope of the AEC's responsibilities and identified several key issues in need of resolution, including the conflict between the AEC's dual responsibilities of promotion and regulation—where promotional duties often overshadowed regulatory functions—the inadequate staffing of qualified technical personnel, procedural challenges in the hearing process, and difficulties in developing policies and regulations for licensing facilities and nuclear materials.[90] Regarding ACRS reviews, the JCAE staff identified two main problems:[91]

1. *Duplication in referring minor problems to the ACRS.* The JCAE staff observed that the ACRS had been asked to review not only every application power or test reactor construction permits but also applications for operating licenses and most amendments to permits and licenses. This arrangement imposed repeated demands on applicants, who had to satisfy the AEC and then make additional presentations on the same content to the ACRS. In some cases, the ACRS prescribed conditions to its approvals, requiring applicants to demonstrate to both the committee and the hearing examiner that they had been fulfilled before the application could move forward. The staff suggested that these prehearing stage burdens could be mitigated by referring only significant, novel, or difficult safety problems to the ACRS.

2. *Lack of a technically qualified body to determine which applications present safety problems calling for ACRS review or public hearings.* The JCAE staff identified that a lack of selectivity on multiple fronts was hindering the regulatory process. Safety issues were submitted to the ACRS without reviewing whether its involvement was necessary, and license amendments and permit conditions were referred without independent evaluation of whether full hearings were warranted. The staff pointed out that experience showed that amendments to construction permits were often necessary as reactors progressed through construction and operation. However, minor technical specification changes, though formally considered amendments, could trigger full review procedures, creating a burden for the ACRS and delays for the applicant. The study emphasized the need for a qualified body empowered to decide whether staff questions require ACRS review or referral to formal hearings.[92]

F. Public Law 87-615

Introduced in 1961, H.R. 12336 and S. 3491, among other provisions, rendered an ACRS review optional for license amendments.[93]

Hearings were conducted on the bill on April 17, 1962. On the question of the impact of Section 3 of the bill, which amends AEA of 1954 Section 182b to make ACRS review optional at the discretion of the AEC, and on the present system and ability of the AEC to refer to the ACRS, AEC Commissioner Loren K. Olson remarked, "I doubt if there would be because we get a little something extra from the ACRS by letting them sort them out themselves. I think this would simply eliminate the necessity for a formal report in cases where there was obviously no significant safety issue involved." He further added, "In the absence of an indication . . . that the ACRS should review it formally, we could obviously shorten the proceeding a great deal. I think it permits informal dispatch of many of these amendments. I don't believe there would be any change in our present procedure of sending them all of the changes."[94]

During the indemnity and reactor safety hearings on April 10 and 12, 1962, ACRS Chairman Dr. Frank Gifford emphasized the committee's desire to maintain oversight of significant license changes under the proposed bill. He explained, "I don't think we are yet well enough able to judge the consequences, even of comparatively small changes, in terms of their possible safety implications. We certainly don't want to consider every minor change, down to the thread of every nut and bolt on a reactor. On the other hand, we don't want to worry that substantive changes are being approved without ACRS scrutiny. Our opinion is that we should have the opportunity to review all substantial changes in the way we are now proposing, and we wouldn't want, at this time, to cut ourselves off from that role."[95]

On this issue, during the hearings on H.R. 12336 and S. 3491, William Kennedy, counsel for the Atomic Products Division of General Electric, proposed an alternative approach to reforming ACRS review. He explained in his opening statement, "The proposed bill would clarify the rules for ACRS review of proposed amendments of the permit or license. There is good reason to go further. The ACRS could perform a more useful role if it were given discretion to decide whether it would review an application at all, and if so, whether it would confine its review to particular questions." He further emphasized that this discretion should "repose in the ACRS and not in the Commission."[96] Mr. Kennedy justified his proposal by stressing the importance of maintaining the committee's independence, stating that granting "the ACRS the discretion simply because doing that seems to me to provide greater assurance that the ACRS will be performing the role which it was originally conceived to perform; namely, to be another check on the staff reviews. If the staff has this discretion, in effect, you are raising questions as to whether the ACRS is an effective check."[97]

The JCAE voted to pass the bills H.R. 12336 and S. 3491 on July 5, 1962, and the Atomic Energy Amendment Act (Public Law No. 87-615) became law on August 29, 1962. Among other changes, it established the Atomic Safety and Licensing Board and limited mandatory hearings to applications for construction permits. The law amended Section 182b of the AEA of 1954, and with respect to license amendments, the ACRS's role became conditional: "The Committee shall also review any application under section 103 or section 104b for an amendment to a construction permit or an amendment to an operating license, but only if the Commission determines that such review is advisable." This shift reflected Congress's intention not to require by statute ACRS review of routine amendments but instead to empower the AEC to determine which cases had safety significant implications, thereby streamlining licensing efficiency.

Appendix B: Initial License Renewals

Section 182b of the AEA of 1954 states that applications to amend power reactor operating licenses have to be reviewed by the ACRS only if the commission specifically refers them. At the end of a power reactor's initial operating term (typically 40 years), the licensee may apply to extend operations for another 20 years. Per commission policy, 10 CFR 54.25 states that each operating license renewal application will be referred to the ACRS for a review and report.

The first application for initial license renewal was received in 1998. As of July 2025, NRC staff had approved 89 license renewal applications, with the ACRS providing reviews on each.[98] Subsequent to President Trump's EO 14300, two license renewal applications—the Perry nuclear power plant in Ohio and the Clinton nuclear power plant in Illinois—were exempted from 10 CFR 54 and did not receive ACRS reviews.[99] Both exemptions cited the EO as the rationale: "Given that following the EO is in the public interest, the EO represents the special circumstance under 10 CFR 50.12(a)(2)(vi) and an exemption from 54.25 is warranted."

It would not be good regulatory practice for the NRC to continue giving itself an exemption from its own regulations. For reasons unrelated to EO 14300, the NRC may consider revisiting its policy at 10 CFR 54. Given the number of initial license renewals that have taken place—most of which were reviewed by the ACRS—it is hard to categorize them as novel or new, and the process and associated guidance documents are now well established.

For that reason, the NRC could benefit from inverting its policy position on ACRS reviews for initial license renewal: For at least the existing light water reactor fleet, the working assumption would be that no ACRS review is needed unless there is an identified reason for having one (e.g., an agency identified a technical concern or the safety of the plant relicensing becomes a matter of greater public interest). As discussed above, the ACRS should be given final say on whether review is warranted.

Many reactors in the existing fleet have or are likely to involve a subsequent license renewal—that is, an extension of a license from 60 to 80 years. Although the experience to date is limited, it does not appear that these extensions present difficult or novel safety issues. This obviates the need for automatic ACRS review and favors an approach in which review is required only when a significant safety issue is presented.

Notes

1. For a list of advanced reactor companies, see NIA, *Advanced Nuclear Reactor Technology: A Primer*, November 2024, https://nuclearinnovationalliance.org/advanced-nuclear-reactor-technology-primer.
2. The ADVANCE Act was passed as part of Public Law 118-67. The full text is available at Congress.gov, "S.870," accessed April 2, 2026, https://www.congress.gov/bill/118th-congress/senate-bill/870. For the NRC tracker, see NRC, "ADVANCE Act Status Dashboard," accessed April 2, 2026, https://www.nrc.gov/about-nrc/governing-laws/advance-act/dashboard.
3. National Academies of Sciences, Engineering, and Medicine, *Laying the Foundation for New and Advanced Nuclear Reactors in the United States*, 2023, https://doi.org/10.17226/26630.
4. The role of the ACRS is described in NRC regulations at 10 CFR 1.13. See NRC, "Panels, Boards, and Committees," last updated July 30, 2018, https://www.nrc.gov/reading-rm/doc-collections/cfr/part001/part001-0013. Beyond new reactor safety reviews, the ACRS also examines regulatory policies and practices, operating reactor safety, safety-related research, and nuclear materials and waste topics, and, at the request of the Department of Energy (DOE), may advise on US naval reactor design safety.
5. JCAE, *A Study of AEC Procedures and Organization in the Licensing of Reactor Facilities* (Washington, DC: United States Government Printing Office, 1957).
6. Ibid.
7. David Okrent, *Nuclear Reactor Safety: On the History of the Regulatory Process* (Madison: University of Wisconsin Press, 1981), 27.
8. Hossein P. Nourbakhsh, *The Enduring Legacy of ACRS: Contributing to Safety-Licensing Review of Reactor Facilities*, December 2022, https://www.nrc.gov/docs/ML2234/ML22342B278.pdf.
9. Ibid., 5.
10. Letter from R. L. Seale, Chairman, ACRS, to Shirley Ann Jackson, Chairman, NRC, "Subject: Report on the Safety Aspects of the Westinghouse Electric Company Application for Certification of the AP600 Passive Plant Design," July 23, 1998, https://www.nrc.gov/docs/ML0912/ML091210257.pdf.
11. Letter from M. V. Bonaca, Chairman, ACRS, to W. D. Travers, Executive Director for Operations, NRC, "Subject: ACRS Reviews of the Westinghouse Electric Company Application for

Certification of the AP1000 Plant Design-Interim Letter," March 17, 2004, https://www.nrc.gov/sites/default/files/doc_library/cdn/legacy/reading-rm/doc-collections/acrs/letters/2004/5102068.pdf.

12. Letter from Mario V. Bonaca, Chairman, ACRS, to Nils J. Diaz, Chairman, NRC, "Subject: Report on the Safety Aspects of the Westinghouse Electric Company Application for Certification of the AP1000 Passive Plant Design," July 20, 2004, https://www.nrc.gov/sites/default/files/doc_library/cdn/legacy/reading-rm/doc-collections/acrs/letters/2004/5142088.pdf.
13. NRC, "NRC Staff's Response to the ACRS Interim Letter Regarding the AP1000 Design," March 3–6, 2004, https://www.nrc.gov/docs/ML0412/ML041260292.pdf.
14. Letter from Mario V. Bonaca, Chairman, ACRS, to Nils J. Diaz, Chairman, NRC, "Subject: Report on the Safety Aspects of the Westinghouse Electric Company Application for Certification of the AP1000 Passive Plant Design," July 20, 2004, https://www.nrc.gov/sites/default/files/doc_library/cdn/legacy/reading-rm/doc-collections/acrs/letters/2004/5142088.pdf.
15. NRC, "Issued Design Certification—Advanced Passive 1000 (AP1000)," last updated January 8, 2026, https://www.nrc.gov/reactors/new-reactors/large-lwr/design-cert/ap1000.
16. Letter from Said Abdel-Khalik, Chairman, ACRS, to Gregory Jaczko, Chairman, NRC, "Subject: Revision 19 to the AP1000 Design Control Document and the AP1000 Final Safety Evaluation Report," September 19, 2011, https://www.nrc.gov/docs/ML1125/ML11256A180.pdf.
17. NRC, "Design Certification—NuScale US600," accessed October 14, 2025, https://www.nrc.gov/reactors/new-reactors/advanced/who-were-working-with/past-license-activities/nuscale.
18. Letter from Matthew W. Sunseri, Chairman, ACRS, to Kristine L. Svinicki, Chairman, NRC, "Subject: Report on the Safety Aspects of the NuScale Small Modular Reactor," July 29, 2020, https://www.nrc.gov/docs/ML2021/ML20211M386.pdf.
19. The focus areas included emergency core cooling systems and their valve performance, the helical-tube steam generator design, boron dilution and return-to-criticality issues, the source term, and probabilistic risk assessment.
20. A standard design approval is NRC staff approval under subpart E of 10 CFR part 52 (whereas design certification is under subpart B) and indicates that the proposed reactor design meets applicable agency safety requirements.
21. Letter from Walter L. Kirchner, Chairman, ACRS, to David A. Wright, Chairman, NRC, "Subject: Report on the Safety Aspects of the NuScale US460 Small Modular Reactor Standard Design

Approval Application," May 21, 2025, https://www.nrc.gov/docs/ML2509/ML25094A191.pdf.

22. From fiscal years 2014, 2017, 2020, and 2023, which were the only years the authors found.

23. Much of the chronology discussed here can be found at NRC, "Palisades Nuclear Plant," last updated March 20, 2026, https://www.nrc.gov/info-finder/reactors/pali.

24. The transcript of the September 3, 2025 ACRS meeting can be found at NRC, *Official Transcript of Proceedings*, accessed April 2, 2026, https://www.nrc.gov/docs/ML2526/ML25261A269.pdf.

25. Letter from Walter L. Kirchner, Chairman, ACRS, to David A. Wright, Chairman, NRC, "Subject: Report on the Safety Aspects of the Reauthorization of Power Operation for the Palisades Nuclear Plant," September 22, 2025, https://www.nrc.gov/docs/ML2525/ML25253A463.pdf.

26. NRC, *2023 Fiscal Year Report: Advisory Committee on Reactor Safeguards*, February 22, 2024, https://www.nrc.gov/docs/ML2405/ML24053A360.pdf.

27. Including early site permits, which are considered a "partial construction permit" in NRC regulations, construction permits, and combined licenses (COLs), which are both a construction permit and an operating license.

28. While separate operating license applications are also subject to ACRS review, they are not analyzed here because there have been no completed reviews of such applications in recent decades.

29. See the discussion on the licensing process in Matt Bowen et al., "Improving the Efficiency of NRC Power Reactor Licensing: The 1957 Mandatory Hearing Reconsidered," Center on Global Energy Policy, November 2023, https://www.energypolicy.columbia.edu/publications/improving-the-efficiency-of-nrc-power-reactor-licensing-the-1957-mandatory-hearing-reconsidered/.

30. This order is not required by statute, and in other contexts (e.g., initial license renewal) ACRS reports have been published after the FSER.

31. NRC, *Safety Evaluation Report for an Early Site Permit (ESP) at the Grand Gulf ESP Site* (NUREG-1840), p. E-5, April 2006, https://www.nrc.gov/docs/ML0610/ML061070443.pdf.

32. The ACRS review of the Vogtle 3&4 COLs (the first AP1000 COLs), for example, contained numerous, specific recommendations, each precipitating an NRC staff response—in some cases (e.g., containment interior debris limitations) to explain how and why the staff intended to handle the issue differently and in others (e.g., power measurement uncertainty) noting that the applicant revised its application or its final safety analysis report accordingly. For the Fermi 3 COL

(the first ESBWR COL), the ACRS identified three generic issues and one specific issue related to protecting equipment from tornado-generated missiles. In the NRC response to the ACRS review of the South Texas COL, the staff supported the ACRS's view that an issue related to fire hazard analyses should be evaluated generically and acknowledged that existing NRC and industry guidance did not address the issue; it also agreed that the standard review plan should be updated regarding another issue the committee raised (turbine rotors). In the case of the North Anna 3 and William States Lee 1&2 COL reviews (the second ESBWR project and fourth AP1000 project where COLs were issued, respectively), by contrast, the ACRS had no recommendations.

33. Another complicating factor for analyzing COL review timelines is that exemptions and associated departures from the certified AP1000 design were later identified as necessary to implement the intended functions of the certified design. Thus, after Vogtle and VC Summer, the applicants for three follow-on AP1000 projects (Lee, Levy, and Turkey Point) requested these exemptions years after their applications were submitted, and in one case (Levy), an ACRS review of the COLA had been already published. After the exemptions were examined for these projects' AP1000 COLs, a final ACRS review and, later, a final SER were published for Levy. Even if the ACRS had not already done an initial review of Levy, however, it's not clear this would have affected the timing of the request for exemptions, and thus it is not obvious how much—or whether—this first ACRS review for Levy added time to the licensing process. In two other non-AP1000 applications, North Anna 3 and South Texas 3&4, the ACRS reviewed earlier draft SERs that still had open items and published interim letters (i.e., in advance of the final ACRS reviews) that conceivably could have added time to the licensing process—especially in the case of South Texas 3&4, where the ACRS did have some comments and recommendations for NRC staff.

34. For an account of this chronology, see Letter from Dennis C. Bley, Chairman, ACRS, to Stephen G. Burns, Chairman, NRC, "Subject: Report on the Safety Aspects of Dominion Virginia Power Combined License Application for North Anna Unit 3," November 15, 2016, https://www.nrc.gov/docs/ML1631/ML16312A412.pdf.

35. Hermes and Hermes 2 are licensed as test reactors, the standards for which are less stringent than those for power reactors. Review times for construction permits are also expected to be shorter than for operating licenses (or COLs) because the design does not need to be complete to obtain a construction permit, and not all safety-relevant questions can be answered at this stage anyway. By contrast, at the operating license stage, the design is complete, and all R&D needed to support it must be completed as well.

36. The authors emailed the NRC to ask whether it knows the cost of ACRS reviews for any reactor licensing actions (e.g., early site permits, construction permits, combined licenses) in recent

decades. The NRC responded that the ACRS charges its costs to NRC business lines rather than to individual licensees or applicants. Email from Scott Burnell, senior public affairs officer, dated April 8, 2025.

37. NRC, *2023 Fiscal Year Report: Advisory Committee on Reactor Safeguards*, February 22, 2024,, https://www.nrc.gov/docs/ML2405/ML24053A360.pdf; NRC, *2020 Fiscal Year Report: Advisory Committee on Reactor Safeguards*, February 22, 2024, https://www.nrc.gov/docs/ML2405/ML24053A363.pdf; NRC, *2017 Annual Report: Review of Federal Advisory Committee*, November 29, 2017, https://www.nrc.gov/docs/ML2405/ML24059A226.pdf; NRC, *2014 Current Fiscal Year Report: Review of Federal Advisory Committee*, November 13, 2014, https://www.nrc.gov/docs/ML1431/ML14317A486.pdf.

38. See NuScale's estimate of the number of ACRS meetings and total hours dedicated to reviewing its design certification in Letter from NuScale to Margaret M. Doane, Executive Director of Operations, NRC, "Subject: Lessons-Learned from the Design Certification Review of the NuScale Power, LLC Small Modular Reactor," February 19, 2021, https://www.nrc.gov/docs/ML2105/ML21050A431.pdf.

39. See Letter from Joy L. Rempe, Chairman, ACRS, to Daniel H. Dorman, Executive Director of Operations, NRC, "Subject: EPRI Topic Report 3002018337," July 31, 2023, https://www.nrc.gov/docs/ML2320/ML23206A128.pdf; and NRC, *Official Transcript of Proceedings*, July 12, 2023, https://www.nrc.gov/docs/ML2322/ML23221A041.pdf.

40. NRC, *2023 Fiscal Year Report: Advisory Committee on Reactor Safeguards*, February 22, 2024, https://www.nrc.gov/docs/ML2405/ML24053A360.pdf.

41. The ACRS briefed the NRC on these efforts on June 7, 2024. NRC, *Encoder 1 AWS*, NRC Vbrick, accessed April 2, 2026, https://nrc.rev.vbrick.com/#/videos/26bd51dd-f91f-4fe8-bf69-8c3d4068bf51.

42. Ibid.

43. The authors emailed the NRC to ask whether data on NRC staff hours charged to ACRS engagement were available at the Office of Nuclear Reactor Regulation for any recent construction permit applications (e.g., from TerraPower or Kairos Power). The agency responded that this level of detail was not available. Email from Scott Burnell, senior public affairs officer, dated November 21, 2025.

44. Hearings by the JCAE on June 25 and November 11, 1975, discussed several legislative proposals to amend Section 182b of the AEA of 1954 from the Executive Branch. For example, a proposal

from the AEC—introduced as HR.13484 in the 93rd Congress—stated that the ACRS would only review construction permit and operating license applications that were specifically referred to it by the commission. An NRC proposal—introduced as S.1717/HR.7002 in the 94th Congress—stated that the ACRS would decide whether construction permit and operating license applications required its review, unless the commission specifically asked the ACRS for a review. One NRC commissioner testified that this would mean that the ACRS "would review a nuclear plant application only when requested by the Commission or when the committee wishes to do so." The chairman of the ACRS at the time, William Kerr, stated in a letter that the ACRS members unanimously supported the amendment.

45. NIA, *Improving the Effectiveness and Efficiency of the Advisory Committee on Reactor Safeguards*, March 2023, 16, https://nuclearinnovationalliance.org/improving-effectiveness-and-efficiency-advisory-committee-reactor-safeguards.

46. Stephen J. Burdick et al., *Recommendations to Improve Nuclear Licensing*, Idaho National Laboratory, April 2025, 25–27, https://inl.gov/content/uploads/2024/11/Recommendations-to-Improve-Nuclear-Licensing.pdf.

47. NEI, *Accelerating NRC Reform: Industry Recommendations*, July 2025, 29, https://www.nei.org/resources/reports-briefs/accelerating-nrc-reform-industry-recommendations.

48. Energy Innovation Reform Project & Center for the National Interest, *How America Can Achieve Nuclear Energy Dominance*, August 2025, https://innovationreform.org/wp-content/uploads/2025/08/2025-08-05-Nuclear-energy.pdf.

49. House Energy and Commerce Committee, "Chairs Rodgers and Duncan Announce Legislative Hearing on Securing America's Energy Future," July 11, 2023, https://energycommerce.house.gov/posts/chairs-rodgers-and-duncan-announce-legislative-hearing-on-securing-america-s-energy-future.

50. Congress.gov, "H.R. 9199," 118th Cong., 2024, https://www.congress.gov/bill/118th-congress/house-bill/9199.

51. Appendix N of 10 CFR 52, which can be found at NRC, "Part 52 – Licenses, Certifications, and Approvals for Nuclear Power Plants," last updated January 9, 2026, https://www.nrc.gov/reading-rm/doc-collections/cfr/part052/full-text.

52. The White House, "Ensuring Accountability for All Agencies," Executive Order 14215, February 18, 2025, https://www.whitehouse.gov/presidential-actions/2025/02/ensuring-accountability-for-all-agencies/.

53. Senate Environment and Public Works Committee, "Oversight of the Nuclear Regulatory Commission," September 3, 2025, https://www.epw.senate.gov/public/index.cfm/hearings?ID=B2051D7E-B995-40A9-8824-5996021F1B97. The relevant exchanges occur between 1:49:00 and 1:51:00 in the video.

54. NRC, "Addendum No. 9 to the Memorandum of Understanding between U.S. Department of Energy and U.S. Nuclear Regulatory Commission on Nuclear Innovation," Section IV. C. 1, October 7, 2019, https://www.nrc.gov/docs/ML2530/ML25303A288.pdf.

55. Francisco Camacho and Peter Behr, "DOGE Told Regulator to 'Rubber Stamp' Nuclear," E&E News, July 14, 2025, https://www.eenews.net/articles/doge-told-regulator-to-rubber-stamp-nuclear/.

56. Senate Environment and Public Works Committee, "Oversight of the Nuclear Regulatory Commission," September 3, 2025, https://www.epw.senate.gov/public/index.cfm/hearings?ID=B2051D7E-B995-40A9-8824-5996021F1B97.

57. National Research Council, *Lessons Learned from the Fukushima Nuclear Accident for Improving Safety of U.S. Nuclear Plants* (Washington, DC: National Academies Press, 2014), https://doi.org/10.17226/18294; International Atomic Energy Agency, *Ensuring Robust National Nuclear Safety Systems—Institutional Strength in Depth* (Vienna: International Atomic Energy Agency, 2017), https://www-pub.iaea.org/MTCD/Publications/PDF/P1779_web.pdf.

58. Stephen Burns et al., "Why the US Must Protect the Independence of Its Nuclear Regulator," *Bulletin of the Atomic Scientists*, July 7, 2025, https://thebulletin.org/2025/07/why-the-us-must-protect-the-independence-of-its-nuclear-regulator/.

59. Given that this option would still involve writing a letter to the commission stating that a review was not necessary, another possibility that might be equally efficient—and one not requiring an amendment to the AEA—would be for the ACRS, where appropriate, to write to the commission at an earlier stage stating that based on its review of a given application, a more detailed review is unnecessary. This would not, however, allow for the possibility of steering the committee toward new and novel issues in statute.

60. Any reform should seek to focus on how ACRS resources can contribute to sound and informed decisions. If the United States were to build, for example, 10 more AP1000 reactors, as has been discussed, the ACRS should not needlessly review all the associated applications, potentially adding time and cost without much benefit. To take one example in particular, if Southern Company were to add another AP1000 to the Vogtle plant site, it is hard to see how, assuming

the design remained the same, an ACRS review would be valuable from either a reactor design or site-specific point of view given past ACRS reviews of the AP1000 deployment at the same site. On the other hand, deployment at other sites might benefit from ACRS reviews if there are any site-specific issues that raise meaningful safety concerns.

61. NRC, "ACRS History," last updated July 7, 2020, https://www.nrc.gov/about-nrc/regulatory/advisory/acrs/history.html.

62. George T. Mazuzan and J. Samuel Walker, *Controlling the Atom: The Beginnings of Nuclear Regulation 1946–1962 (NUREG-1619)* (Washington, DC: NRC, 1997), 60, https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1610/index.

63. NRC, "ACRS History," last updated July 7, 2020, https://www.nrc.gov/about-nrc/regulatory/advisory/acrs/history.html.

64. Mazuzan and Walker, *Controlling the Atom*, 61.

65. Nourbakhsh, *The Enduring Legacy of ACRS*, 4.

66. Ibid.

67. The JCAE was a congressional committee formed to oversee all aspects of civilian and military atomic energy applications. It existed from 1946 to 1977.

68. J. Samuel Walker and Thomas R. Wellock, *A Short History of Nuclear Regulation, 1946–2024* (Washington, DC: NRC, 2024), 10, https://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0175/index.

69. Nourbakhsh, *The Enduring Legacy of ACRS*, 4.

70. Walker and Wellock, *A Short History of Nuclear Regulation*, 11.

71. JCAE, "AEC Procedures and Organization in Licensing of Reactor Facilities," 1–2.

72. Ibid., 32–33.

73. Ibid., 33.

74. Ibid., 34.

75. US Congress, *Congressional Record: Proceedings and Debates of the 85th Congress, First Session*, 103, 3 (March 21, 1957): 4093–94, https://www.congress.gov/bound-congressional-record/1957/03/21/senate-section.

76. Ibid.

77. Ibid.

78. JCAE, "Governmental Indemnity and Reactor Safety," US Congress, 85th Congress, March 25–27 Washington, DC: United States Government Printing Office, 1957).

79. Ibid., 121.

80. Ibid., 161.

81. Ibid., 129–130.

82. Ibid., 273, 276.

83. H.R. Rep. No. 85-435, at 12 (1957).

84. Ibid.

85. 42 U.S.C. § 2039.

86. JCAE, *Improving the AEC Regulatory Process*, vol. I, Congress of the United States (Washington, DC: United States Government Printing Office, 1961).

87. JCAE, *Improving the AEC Regulatory Process*, vol. II, appendix 5; *The Regulatory Program of the Atomic Energy Commission, November 1960*, Congress of the United States (Washington, DC: United States Government Printing Office, 1961), 89.

88. JCAE, *Improving the AEC Regulatory Process*, vol. 1, appendix B, 405–06.

89. Ibid., 406–07.

90. JCAE, *Improving the AEC Regulatory Process*, vol. I, VIII.

91. Ibid., 48–52.

92. These two issues are discussed in Ibid., 48–52.

93. Hearing Before the Subcommittee on Legislation of the JCAE, Congress of the United States, Eighty-Seventh Congress, Second Session, *AEC Regulatory Problems (H.R. 12336 and S. 3491)* (Washington, DC: United States Government Printing Office, April 17, 1962), 1.

94. Ibid., 29.

95. Indemnity and Reactor Safety, Hearings Before the Subcommittee on Research, Development,

and Radiation, of the JCAE, Congress of the United States, 87th Congress, Second Session (Washington, DC: United States Government Printing Office, April 10–11, 1962), 52–53.

96. Hearing, H.R. 12336 and S. 3491, 87th Congress, Second Session, 1962, 75.

97. Ibid., 80.

98. NRC, *Clinton Power Station*, Unit 1; Exemption, August 29, 2025, https://www.nrc.gov/docs/ML2522/ML25227A003.pdf.

99. Ibid.; NRC, *Perry Nuclear Power Plant, Unit No. 1; Exemption*, July 7, 2025, https://www.nrc.gov/docs/ML2518/ML25183A164.pdf.

Center on
Global Energy Policy
at COLUMBIA | SIPA