

A NEW NUCLEAR AGE

**HOW 2023 DEVELOPMENTS WILL
IMPACT THE INDUSTRY IN 2024**

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Morgan Lewis's energy lawyers regularly track developments impacting the nuclear industry on the firm's [Up & Atom](#) blog. Throughout 2023, the team provided updates on new rules and guidance from the US Nuclear Regulatory Commission (NRC or Commission) and the US Department of Energy (DOE) that impacted cybersecurity, small modular reactors, advanced reactors, sustainability, export controls, plant decommissioning, microreactors, fusion systems, and more. This report provides an overview of those developments from the last year, as well as thoughts on what 2024 may hold for the nuclear energy industry.

SAFETY AND SECURITY

Cybersecurity Updates

Last year, for the first time in more than a decade, the NRC issued revised guidance around cybersecurity programs for nuclear power reactors (first [in February](#), and again [in August](#)). This updated guidance is vital to the nuclear energy industry, especially given the pace of progress for both technology and those who may seek to exploit its vulnerabilities.

The new guidance clarified the type of cyberattacks that require notification to the NRC, the timeliness and method for making such notifications, and how to submit follow-up written reports to the NRC. It also provided insights gained from actual cybersecurity attacks, while accounting for new technologies and updates based on the latest guidance from the National Institute of Standards and Technology and the International Atomic Energy Agency. The guidance also requires nuclear power plants to document how they have achieved "high assurance" that their networks are adequately protected from cyberattacks.

Some of the most significant changes involved additions and modifications to the defined terms section, including revisions to the definitions of "adverse impact," "credible" information, and "compromise." Additionally, the definition for a critical digital asset expanded significantly to include both components and support systems.

Emergency Preparedness

In November 2023, the NRC [finalized a rule on emergency preparedness](#) for small modular reactors (SMRs) and advanced reactors. The rule moves away from the one-size-fits-all approach for larger reactors and recognizes the inherent safety features of newer reactor designs, allowing for more targeted emergency planning based on specific risks. Under the new framework, SMRs and advanced reactors can develop emergency plans based on their ability to demonstrate effective emergency response through drills and exercises. It also allows for emergency planning zones to be determined by the potential consequences of an accident, rather than a fixed distance.

In addition to this final rule, the NRC concurrently issued [Regulatory Guide 1.242](#), titled Performance-Based Emergency Preparedness for Small Modular Reactors, Non-Light-Water Reactors, and Non-Power Production or Utilization Facilities. The guide identifies methods that the NRC considers acceptable for SMRs and advanced reactors to use in order to demonstrate compliance with the new performance-based emergency preparedness requirements.

MICROREACTOR AND FUSION DEVELOPMENTS

Microreactor Licensing Updates

In October 2023, in a letter submitted to NRC Chairman Christopher Hanson, the NRC's Advisory Committee on Reactor Safeguards (ACRS) [endorsed](#) the NRC staff proposal for licensing microreactors. The proposal would allow factory-built microreactors with features that preclude criticality to be loaded with fuel and undergo operational testing at the factory before being transported to an installation site.

If approved by the Commission, this approach would create a lower regulatory burden in line with the anticipated decreased potential safety hazards posed by such microreactors. While the ACRS endorsed the proposal, they noted some issues that still need to be addressed, such as microreactor eligibility and further guidance on specific safety features.

Fusion Energy: Updated Licensing Framework and Rule Language Guidance

Throughout 2023, the NRC began to develop a regulatory framework for fusion energy systems and [issued preliminary proposed rule language](#) for the licensing and oversight of a broad array of fusion systems currently under development. Importantly, to regulate nuclear fusion, the NRC decided to modify the existing process for licensing the use of "byproduct materials" contained in [10 CFR Part 30](#). This is significant because the process to obtain a Part 30 license is far less onerous than the process to obtain a license as a nuclear power facility, a pathway the NRC also contemplated using for fusion systems.

The proposed rule defines a "fusion system" as "a system that, through use of byproduct material or to produce byproduct material, induces nuclear fusion and includes any associated radiation, radioactive material, and supporting structures, systems, and components that are used to contain, process, or control radiation and radioactive materials."

It also revised the definition of a "particle accelerator" and added a new provision for the disposal of waste resulting from fusion systems. Additionally, it added requirements to the application process for a specific license for a fusion system.

SUSTAINABILITY

Environmental Regulation Updates

At the start of 2023, the NRC [unanimously approved](#) the publication of a proposed rule to update its environmental regulations and a draft update to its Generic Environmental Impact Statement for License Renewal of Nuclear Plants (known as the License Renewal GEIS).

The proposed rule aims to bring clarity to the subsequent license renewal process and would allow environmental reviews of pending applications to resume. If finalized, the rule would remove the limitation of "initial" license renewal, making clear that the environmental assessment "applies to applications for initial or subsequent license renewal."

For the License Renewal GEIS update, the NRC staff identified 80 environmental issues—including newer issues like the impact of greenhouse gases—associated with operations and refurbishment. It also reclassified some issues as generically resolvable.

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Hydrogen and Decarbonization

In March 2023, New York's Nine Mile Point Nuclear Station [began producing hydrogen](#) as part of a demonstration project sponsored by the DOE. Although the plant produced hydrogen solely for internal use, the project validates that reliable and emission-free nuclear energy can be used to produce clean-burning hydrogen, which is vital to overall decarbonization efforts.

Hydrogen has become a sought-after alternative energy source as industrial sectors strive to reduce carbon emissions. Indeed, the DOE [has offered funding opportunities](#) to improve the ability to economically produce the large volumes of hydrogen needed for commercial use. It also recently [established seven "hydrogen hubs"](#) throughout the nation.

While hydrogen has unique advantages as a fuel, for it to facilitate a reduction in carbon emissions, the electricity used to make it must also be emission-free. As a reliable form of clean energy with a relatively small footprint compared to other clean energy solutions, nuclear energy may be well suited for this need. Although nuclear and hydrogen production have unique regulatory challenges, both come with tremendous opportunities to reshape energy production and usage.

EXPORT CONTROLS

Generally Authorized Countries

In January 2023, the DOE made changes to the list of countries eligible for general authorizations under [10 CFR Part 810](#). The updates included granting Mexico the status of a fully generally authorized destination, while removing Colombia and Egypt from the [list of countries eligible for a general authorization](#). These changes were required to take advantage of grandfathering provisions for generally authorized activities involving Columbia and Egypt, and to ensure compliance programs are updated.

In Mexico's case, the update was the result of the entry into force of the US-Mexico Civil Nuclear Cooperation Agreement, known as a 123 Agreement because it is authorized by Section 123 of the Atomic Energy Act. In the cases of Colombia and Egypt, their status updates resulted from the lapse of each of their respective 123 Agreements. South Africa's 123 Agreement also lapsed, but the country was not included in the updates, suggesting its negotiations with the United States are ongoing.

Suspension of China's General License

In August, the NRC [published an order](#) suspending the general license to export special nuclear material, source material, and deuterium for nuclear end use to China. Under the order, which took effect immediately, any person wanting to send those materials to China must apply for, and receive, a specific license prior to export.

The order was part of a larger US government determination that more oversight and control of the exportation of these materials—which can be used for both commercial and military purposes—is necessary to further the national security interests of the United States.

The move also emphasizes the shifting nature of nuclear trade with China. US exporters planning to ship nuclear or related material and equipment to China must carefully analyze their planned exports prior to shipment.

PLANT DECOMMISSIONING AND SPENT FUEL

Updated Guidance on Costs and Funding for Decommissioning Plants

Throughout 2023, the NRC made several updates regarding the funding and expense for decommissioning retired plants. First, the agency [issued a proposed rule](#) that would amend its decommissioning financial assurance mechanism.

The Atomic Energy Act of 1954 requires that in order to obtain and maintain a reactor license and certain materials licenses, applicants and licensees must demonstrate reasonable assurances that funds will be available when needed for decommissioning. Currently, an applicant/licensee may make this demonstration through a parent company guarantee or a self-guarantee, provided they satisfy financial test metrics or the minimum guarantor bond credit rating criteria.

To comply with the Dodd-Frank Act passed in the wake of the 2008 financial crisis, the NRC initially sought to eliminate the credit rating option entirely. Following pushback from the industry, the agency issued a new notice of proposed rulemaking that would remove bond rating requirements for both parents and self-guarantees and add the requirement that guarantors demonstrate “creditworthiness that demonstrates an adequate capacity to provide full and timely payment of the amount guaranteed.”

The NRC also requires plants to regularly update their decommissioning cost estimates, considering such factors as increased labor, energy, and waste burial costs. In February 2023, the agency [published Revision 19 of NUREG-1307](#), providing updated burial cost escalation factors. The revision also included increases for pressurized water reactors and decreases for boiling water reactors. While some plants have flexibility in choosing disposal facilities and thereby influencing costs, concerns remain about overestimated costs due to outdated calculation methods and limited waste disposal practices considered.

Finally, in June 2023, the NRC [issued a draft interim staff guidance](#) (ISG) clarifying regulations surrounding nuclear decommissioning trust (NDT) funds. These funds can only be used for “decommissioning” expenses (as defined by the NRC) before plant shutdown, unless exempted or deposited in dedicated subaccounts.

The ISG reiterated this limitation and explained certain exemption criteria, with a focus on demonstrating adequate remaining funds and specific non-radiological decommissioning purposes. It also clarified subaccount usage for non-radiological activities like spent fuel management, while emphasizing accountability and cautioning against unauthorized fund reallocation. The ISG brings renewed clarity on NDT use restrictions and exemption possibilities.

Updated Consent-Based Siting Process for Spent Fuel

In 2023, the DOE’s Office of Nuclear Energy [updated](#) its “road map for implementing a consent-based siting process” for storing used nuclear fuel. The update incorporated public feedback, clarified the focus of the DOE’s used fuel siting efforts, and provided aspirational timelines for project development. The new plan includes a greater emphasis on environmental justice, an increased role for potential host communities, and increased funding opportunities to support meaningful community participation.

OTHER UPDATES

Insurance

In October 2023, the NRC [published a final rule](#) that increased the amount of third-party liability coverage required under the Price-Anderson Act for large nuclear power plants. The new rule, which took effect

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January 1, 2024, raised the minimum amount of third-party liability coverage from \$450 million to \$500 million per incident.

The update came a little more than a month after the NRC's [once-every-five-year adjustment for inflation](#) to the maximum total and annual deferred premium amounts for the "secondary layer" of offsite liability coverage. Inflation in the overall economy meant an increase in the maximum deferred premium of almost 25%. After applying the inflation adjustments, the maximum deferred premium increased from \$131.056 million to \$158.026 million per operating reactor, per incident. The maximum annual assessment has now increased from \$20.496 million to \$24.714 million per operating reactor, per incident.

DOE Government Contracting

In November 2023, the DOE [proposed a comprehensive revision](#) to the Department of Energy Acquisition Regulation (DEAR) for the first time in decades, hoping to update and streamline the DEAR's policies, procedures, provisions, and clauses. The DEAR implements and supplements the Federal Acquisition Regulation (FAR) for the DOE's specific needs.

The proposal includes four major categories of change:

- Update, clarify, or eliminate unclear, obsolete, or unnecessary duplicates of FAR's coverage
- Allow organizations to deviate from the FAR and DEAR by incorporating class deviations into the coverage
- Streamline DEAR policies and procedures by proposing various editorial revisions
- Standardize local the DOE language by adding several new minor clauses, thus eliminating the multiple local clause versions in current use

The revisions would generate some additional costs for contractors, but the DOE has stated that the public benefits of the proposed changes outweigh the potential burdens.

TRENDS TO WATCH IN 2024

The nuclear energy industry saw many developments throughout 2023. This next year will likely be no different.

We expect to see continued momentum for advanced nuclear reactor development, with more applications for NRC construction permits being filed for such reactors following the successful construction permit licensing for Kairos Power's Hermes test reactor. This will be coupled with further progress on the DOE's Advanced Reactor Demonstration Program and the finalization of a rule governing the licensing of advanced reactors, highlighting the industry's commitment to innovation.

The DOE will also expand its efforts to ensure a domestic supply of enriched uranium product. Additionally, we expect that the NRC will finalize updates to its environmental impact statements for operating plants seeking license renewals. Also in 2024, we expect Congress to renew the Price-Anderson Act for at least another 20 years, thereby authorizing the NRC to issue nuclear hazards indemnities for advanced reactors and the DOE to issue similar indemnities to its government contractors.

On the international front, we can likely expect nuclear export controls to become more stringent for recipients in China and Russia. We can also anticipate new 123 Agreements with countries in emerging nuclear markets.

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Overall, these developments, marked by technological advancements, increased clarity of policies and regulations, and a robust focus on energy and environmental security, present a positive vision for the nuclear industry in 2024.

CONTACTS

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