UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

PLEASE RESPOND BY:
September 13, 2023

COMDAW-23-0001/COMAXC-23-0002

August 29, 2023

MEMORANDUM TO: Chair Hanson
Commissioner Crowell

FROM: Commissioner Wright
Commissioner Caputo

SUBJECT: Measuring NRC Success

Introduction

When Congress established the Nuclear Regulatory Commission in the Energy Reorganization Act of 1974, it assigned the licensing and regulatory functions of the Atomic Energy Commission to our newly formed agency. In doing so, Congress left unchanged the declarations, findings, and purposes of the Atomic Energy Act, including that the atomic energy "shall be directed to promote world peace, improve the general welfare, increase the standard of living, and strengthen free competition in private enterprise."[1] Congress also stated the purpose that "...it is in the public interest that the *licensing and related regulatory functions* of the Atomic Energy Commission be separated from the performance of the other functions of the Commission" thus designating licensing as the agency's principal function.[2] It is within this context that we seek better measurement of the agency's performance of its licensing responsibilities.

There is a growing consensus that the NRC needs to improve the execution and timely completion of its licensing activities if nuclear energy is to make a significant contribution to meeting national and global needs for clean energy and energy security.[3] All eyes—Congress and the Administration, nuclear sector stakeholders, the public, and the international

---

1 Atomic Energy Act §§ 1–3, 42 U.S.C. §§ 2011–13.

2 Energy Reorganization Act of 1974 § 2c, 42 U.S.C. § 5801(c). [emphasis added]

3 *See, e.g.*, Ranking Member Capito Opening Statement at Nuclear Regulatory Commission Budget Hearing (Apr. 19, 2023), https://www.epw.senate.gov/public/index.cfm/press-releases-republican?ID=514B6627-2DA1-4B12-9F42-A7761A13E0CF; Idaho National Laboratory, "Recommendations to Improve the Nuclear Regulatory Commission Reactor Licensing and Approval Process" (Apr. 2023), https://inldigitallibrary.inl.gov/sites/sti/sti/Sort_65730.pdf; Letter from Craig H. Piercy, American Nuclear Society, to the Hons. Rogers, Pallone, Duncan, and Degette, https://www.ans.org/file/11459/1/05.05.23%20-%20ANS%20Comments%20on%20NRC%20Reactor%20Licensing%20Approval%20Process.pdf (May 5, 2023); Nuclear Innovation Alliance, "Promoting Efficient NRC Advanced Reactor Licensing Reviews to Enable Rapid Decarbonization" (Dec. 2021), https://nuclearinnovationalliance.org/sites/default/files/2021-12/NIA%20Promoting%20Efficient%20NRC%20Advanced%20Reactor%20Licensing%20Reviews%20t

community—are watching the NRC and asking (1) if the NRC is ready to review advanced nuclear reactor applications and (2) if the NRC can handle the expected growth in applications in an efficient and timely manner.[4]

We do not have a centralized, comprehensive process for measuring our success. As a result, it is imperative the agency identify, establish, and communicate to the public, clear metrics on the status and schedules of licensing reviews. Doing so aligns with our Principles of Good Regulation, will help the agency identify innovative process improvements, and will inspire confidence in our ability to meet this moment.[5]

Background and Purpose

Congress provided direction to us in the Nuclear Energy Innovation and Modernization Act (NEIMA) (January 2019) and has conducted significant oversight on this matter. Nuclear sector stakeholders have repeatedly offered recommendations regarding the NRC.[6] Most recently, the House Committee on Energy and Commerce requested, from no less than nine nuclear sector stakeholders, recommendations on how Congress and the NRC can improve the licensing review and approval process.

Subsequently, and pertinent to performance metrics as addressed in this communication, the Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy (ADVANCE) Act, co-sponsored by the Environment and Public Works Committee Chair Senator Carper and Ranking Member Senator Capito and included as an amendment to the National Defense Authorization Act (NDAA), would update the performance and reporting requirements found in NEIMA for the review and assessment of performance metrics and milestone schedules and adds the requirement to revise and improve them, as appropriate, "to provide the most efficient metrics and schedules reasonably achievable."[7]

For its part, the agency maintains that it has listened to stakeholder recommendations and, with various initiatives in place, is addressing the areas of interest noted by Congress. The NRC has stated publicly that it is on pace to be ready when called upon to license and approve the

---

o%20Enable%20Rapid%20Decarbonization.pdf; Nuclear Energy Institute, "Is NRC Ready to Meet the Moment" (June 13, 2023), https://www.nei.org/news/2023/is-the-nrc-ready-to-meet-the-moment.

[4] *See, e.g.,* questions asked by members of the Committee on Environment and Public Works of the Senate and the Committee on Energy and Commerce of the House of Representatives.

[5] Additionally, as Commissioners, we recognize the hard work the NRC staff does every day to support the American People and that our current programs often fail to communicate our success to external stakeholders and the public.

[6] *See, e.g.*, Congressional direction to the NRC in the "Nuclear Energy Innovation and Modernization Act, January 14, 2019" (P.L. 115-439) (NEIMA) (https://www.congress.gov/115/plaws/publ439/PLAW-115publ439.pdf) and the "ADVANCE Act, March 30, 2023" (S. 1111) (https://www.congress.gov/bill/118th-congress/senate-bill/1111/text). Stakeholder recommendations include the Nuclear Energy Institute's "A Framework for Regulatory Transformation" (March 2018) (ML18180A313) and "Recommendations for Streamlining Environmental Reviews" (March 2020) (www.nei.org/NEI-White-Paper-Recommendations-for-Streamlining-Environmental-Reviews-for-Advanced-Reactors.pdf) and the Idaho National Laboratory's report "Recommendations to Improve the Nuclear Regulatory Commission Reactor Licensing and Approval Process" (April 2023) (https://inldigitallibrary.inl.gov/sites/sti/sti/Sort_65730.pdf).

[7] National Defense Authorization Act for Fiscal Year 2024, Sec. 8141(w), Performance and Reporting Update (S. 2226) (ADVANCE Act.).

deployment of advanced nuclear reactors.[8] Setting Commission expectations for effectiveness, efficiency, and timeliness must include concrete, meaningful metrics to enable the staff to demonstrate they are meeting those expectations.

The most high-profile of the agency's near-term challenges is the readiness and ability to review advanced reactor applications in a timely manner.[9] In addition to the ongoing licensing and oversight of new and operating reactors, existing licensees will continue to pursue license renewals and power uprates. This surge in work coincides with a workforce transition at the agency that will require significant efforts to hire, train, and integrate a sizable cadre of new employees. These challenges make the development and use of meaningful metrics vital to ensuring that potential issues are identified early and resolved efficiently in order to meet the mission of the agency.

Consistent with the agency's values and Principles of Good Regulation, we must seek continual improvement. Continual improvement includes examining our existing internal processes to look for efficiencies and avoid busywork burdening the staff. Without data, it is difficult to identify inefficiencies, resource constraints, or knowledge management challenges. And we will not be able to see and celebrate positive progress unless we are measuring that success.

While our role as Commissioners is primarily in the realm of policy setting, we should take action to address the growing perception that the agency may be a barrier rather than an enabler to the timely development of nuclear energy. As Commissioners, we must pursue a clear understanding of the agency's performance and ensure timely execution of licensing responsibilities.[10]

It is important for this information to be transparent in keeping with our Openness Principle of Good Regulation: "Nuclear regulation is the public's business, and it must be transacted publicly and candidly." The agency goes to great lengths to communicate with external stakeholders, conduct public meetings, and continuously strives to improve engagement. However, the status of licensing reviews, as visible via the agency's public-facing websites, are prime opportunities for us to further increase our transparency and better communicate to all our stakeholders.

Establishing Transparent, Detailed, Objective Performance Metrics

In NEIMA, Congress directed the NRC to provide performance metrics and milestone schedules for the "requested activities of the Commission," which NEIMA defines as: the processing of applications for design certifications or approvals, licenses, permits, license amendments, license renewals, certificates of compliance, power uprates, and any other activity requested by a licensee or applicant.[11] While the agency has reported these activities to Congress since

---

[8] *See, e.g.*, NRC testimony before the Committee on Environment and Public Works of the Senate (May 2023) and the Committee on Energy and Commerce of the House of Representatives (June 2023), as well as statements made during the Regulatory Information Conference (RIC) (March 2023).

[9] See COMAXC-23-0001.

[10] As stated by then-Commissioner Jeff Baran in COMJMB-23-0001, "Establishing Commission Expectations for the Effectiveness, Efficiency, and Timeliness of New Reactor Reviews" (June 9, 2023) (ML23160A213): "the Commission must provide leadership and accountability by sharing its vision of – and expectations for – effective, efficient, and timely new reactor licensing reviews." We strongly agree.

[11] *See* NEIMA, Sec.3.(10).

2019, the reports contain only high-level, generic information which by itself, is insufficient in signifying that the NRC is measuring performance or inspiring performance improvement.

Currently, we rely on the metrics listed in the Congressional Budget Justification. While these metrics are useful, they also come with significant limitations in that they are typically high level, only calculated on an annual basis and are routinely reported as averages. However, averages do not provide a clear picture of the agency workload or reflect difficulties that arise on specific projects. To effectively and efficiently measure performance and inspire performance improvement, metrics must be reported in real-time, have goals set such that they are challenging enough to drive improvement and be specific enough to identify individual challenges or inefficiencies.[12]

Similarly, the NRC's Annual Performance Plans, developed under the GPRA Modernization Act of 2010 (GPRAMA) § 1115(b)(6), "establish a balanced set of performance indicators to be used in measuring or assessing progress toward each performance goal, *including, as appropriate, customer service, efficiency*, output, and outcome indicators."[13]

While the Commission does report to its Congressional oversight committees on licensing and other regulatory activities, it is notable that the Annual Performance Plan does not include milestones or performance indicators on customer service or efficiency. And the indicators that are provided are not at a granularity that would allow the staff or the Commission to determine the causes of any negative trend.

By comparison, one of the biggest successes throughout the history of the agency has been the implementation of the Reactor Oversight Process (ROP). The ROP performance indicators are discrete elements of performance for individual licensees, and it is the measurement and communication of these individual discrete performance indicators that enable the NRC, licensees, and other stakeholders to identify specific areas needing attention to achieve performance improvement. Industry stakeholders agree: the NRC has successfully used ROP performance indicators as an objective measure of licensees' safety performance and the industry's safety performance has improved.[14] The NRC should adopt similar performance indicator-type metrics to help verify whether the agency's learning curve is leading to more efficient, consistent and predicable reviews.

---

[12] It is the experience of the authors that good usage of metrics requires metrics be measurable, meaningful, and actionable. The metrics provided in the CBJ are not actionable in order to measure performance in real or near-real time or inspire performance improvement. Lacking in the area of being actionable take two forms. The first is that the goals chosen for the metrics are not challenging; they do not drive continuous improvement but instead allow the creation and sustainment of a comfort zone. Almost all metrics in the CBJ are easily met. And if the agency misses a metric, the action taken by the agency is often limited to explaining why the goals could not be met rather than offering a path to modifying the behavior of the agency. The second form of issue is the use of average metrics rather than the tracking of individual projects. Actionable metrics would use indicators that show what projects or portions of projects are in need of heightened management attention or additional resources.

[13] Under the GPRA Modernization Act of 2010 (GPRAMA) and Management Directive 6.9, the agency develops and submits to Congress an annual performance budget as a part of a "performance management program that improves the NRC's effectiveness and efficiency in achieving its mission and strategic goals."

[14] NEI 20-04, "The Nexus Between Safety and Operational Performance in the U.S. Nuclear Industry," Mar. 2020.

Given the available business intelligence tools and data already being collected, implementing meaningful, near real-time measures is firmly within our grasp. For example, the Resource Estimator for Operating Reactor Licensing is a data-driven project through which internal and external stakeholders can easily identify the amount of NRC staff resources and time likely needed to complete various types of licensing actions. [15] The Hermes-Kairos Project Status Dashboard is also an example of great work the agency is already pursuing along these lines, specifically its detailed project schedule. [16]

Lastly, establishing performance metrics and milestone schedules that measure performance would set Commission expectations for effectiveness, efficiency, and timeliness and enable the staff to know whether they are meeting those expectations. This would allow full transparency but, more importantly, much needed accountability for the NRC.

Metrics Designed to Demonstrate Success

Thus, with this COM, we propose that the Commission direct the staff to implement detailed, transparent, near real-time performance metrics to provide Congress, licensees and applicants, stakeholders, and the public a window into our execution so that they can track our progress and see for themselves.

The performance metrics should be:

(1) available publicly on the NRC's website in near-real-time (i.e., within two weeks);[17]
(2) addressed in the strategic plan;
(3) summarized in the annual performance plan and report, and
(4) used to inform resource requests in future Congressional Budget Justifications.

Performance metrics and milestone schedules for the "requested activities of the Commission," specifically as directed by NEIMA, include: the processing of applications for design certifications or approvals, licenses, permits, license amendments, license renewals, certificates of compliance, power uprates, and any other activity requested by a licensee or applicant.[18]

These metrics and schedules are not currently found in a 'one-stop-shop' public-facing webpage but are instead found scattered across numerous NRC webpages, each containing varying degrees of metric and milestone information.[19]

---

[15] https://www.nrc.gov/reactors/operating/licensing/resource-estimator.html.

[16] https://www.nrc.gov/reactors/non-power/new-facility-licensing/hermes-kairos/dashboard.html.

[17] This data should be available both in plain language for consumption by the general public and where possible, as structured datasets to enable third party analyses. The agency already captures certain data and makes it publicly available. *See, e.g.,* Data, https://www.nrc.gov/data/index.html (last reviewed/updated Dec. 16, 2022).

[18] See NEIMA, Sec.3.(10).

[19] The purpose of NEIMA is to provide "a program to develop the expertise and regulatory processes necessary to allow innovation and the commercialization of advanced nuclear reactors." To accomplish this, Congress directed the NRC develop "for the requested activities of the Commission" performance metrics and milestone schedules. For performance metrics and milestone schedules to lead to the development of expertise and regulatory processes that allow innovation and the commercialization of advance nuclear reactors, the metrics and schedules must actually measure performance and inspire performance improvement.

For example, the Generic Milestone Schedules of Requested Activities of the Commission webpage (which provides performance metric and milestones schedules)[20]and the NRC Operating Reactors Performance Dashboard[21] are both examples of the staff communicating performance metric and milestone information. While the readings are quick and easy to read, they do not provide much information to the viewer. Still, we see them as a good starting point on which to build. Consolidating information from the disparate websites into a centralized location, standardizing the data presented and providing a more granular level of detail would better meet with NEIMA requirements and our Principles of Good Regulation.

Lastly, NEIMA metrics should not be considered the end goal, but rather a starting point. The agency should continually strive to achieve efficiencies equal to its top quartile in historic performance in each category.

Therefore, to meet the Commission's direction for performance metrics stated above and to ultimately achieve the requirements laid out in NEIMA, the staff is directed to include, but is not limited to, the following performance measures:

- Major milestones for the review of applications including design certifications, licenses, permits, license renewal, license amendments, certificates of compliances, and any other activity requested by a licensee or applicant (e.g., power uprates, white papers, topical reports, license transfers, exemptions, etc.).
- The staff should publish the activity/project review schedule by utilizing tools already available in the agency such as Gantt charts or any other timelines providing details for phases appropriate to the review, including:
  - Filing and docketed date
  - Acceptance date
  - Each round of request for supplemental information (RSIs), request for information (RAIs), feedback or audits including response time
  - Resolution of technical issues elevated above the technical reviewer level
  - Each chapter of a safety evaluation (SE)
  - Final product completion date (e.g., Draft SE, Final SE, feedback letter for white papers)
  - ACRS review start/completion
    - Subcommittee meeting
    - Full Committee meeting
    - Letter Report
    - Staff response if requested.
  - Environmental Review:
    - Scoping
    - Draft Environmental Impact Statement (EIS)/Environmental Assessment (EA)
    - Comment resolution
    - Consultations
    - Final EIS/EA
  - Hearings
  - Record of decision or final product issuance date

---

[20] Generic Milestone Schedules of Requested Activities of the Commission. https://www.nrc.gov/about-nrc/generic-schedules.html.

[21] Operating Reactors Performance Dashboard. https://www.nrc.gov/reactors/operating/nrc-performance-dashboard.html.

- Rulemaking, if applicable
  - Proposed rule
  - Comment resolution
  - Final rule
  -

To demonstrate progress of an activity or project (or project health), the staff should publish:

- Estimated vs. utilized FTE/hours/contract dollars demonstrating consumption of resources
- Timeline depicting status of the project from filing to completion.

The staff should prioritize the development of project, office, and division level information for new and advanced reactor reviews to further allow for analysis and have this dashboard publicly available. Prior to publishing these datasets, the staff should communicate with appropriate stakeholders.

To make the updating process as streamlined and consistent as possible, data should automatically be drawn from existing data management systems across the agency whenever possible. For example, actual resources/hours expended should be tied to data from HCM Cloud or another source that actively tracks hours billed to a project if possible. Data fields involving manual updates and the identification of when the data was last updated as well as resources on who to contact for questions should also be provided. Whether updated manually or through automatic means, the data should be updated promptly (e.g., bi-weekly).

Conclusion

In 1954, the Atomic Energy Act declared "…the development, use, and control of atomic energy shall be directed so as to make the maximum contribution to the general welfare…."[22] In 2023, the Atomic Energy Act declaration is being undertaken by the whole host of governing bodies and nuclear stakeholders, all of whom are interested in maximizing the "contribution to the general welfare" made by nuclear technology and driving towards what the Principles of Good Regulation call, "the best possible management and administration of regulatory activities" and "the highest technical and managerial competence."

A final example of this effort to build accountability and continuous improvement comes from the Institute of Nuclear Power Operations (INPO). Known for holding industry utilities to the highest standard, INPO 19-003, *Staying on Top – Advancing a Culture of Continuous Improvement* was published to provide "a set of values and behaviors for establishing a culture that achieves sustainable results and enables continuous performance improvement." INPO's decade long analysis of "the organizational aspects of sustaining high performance" led to the adoption of five core values:

> In support of their common, deep-seated beliefs in continuous improvement in the pursuit of excellence, they each placed particular value on their long-term views and strategic focus, their leadership and talent development, their very high-performance standards, their continuous learning, and their ability to see and correct their own problems.[23]

---

[22] Atomic Energy Act of 1954 Section 1.a.

[23] INPO 19-003, Staying on Top – Advancing a Culture of Continuous Improvement (2021).

We are not suggesting that INPO has it all figured out: all organizations have their strengths and weaknesses. INPO demonstrates how nuclear stakeholders are trying to maximize nuclear power's "contribution to the general welfare" and are not settling for the status quo or maintaining performance in a comfort zone.

Through this COM, the implementation of the type of performance metrics detailed above is an efficient and effective way for the NRC to meet the requirements found in NEIMA help inspire confidence in our ability to efficiently process applications. Transparent, near-real time performance metrics are a key tool to drive continuous improvement.

The agency's efficient execution of licensing decisions, our principal function, is the focus of significant external scrutiny and as such, carries significant reputational risk. As the gatekeeper for the deployment of advanced technologies and the continued operation of existing plants, all eyes are on us. We have a skilled and dedicated workforce and many high-quality processes in place. Meaningful metrics can bring it together to achieve great execution.

SECY, please track.

cc: SECY
OGC
OCA
OPA
CFO