Planned Activities and Topics for Future Consideration

The staff is developing the operational and security programs portion of the Advanced Reactor Construction Oversight Program (ARCOP) baseline inspection program using a similar process to how the performance monitoring of structure, system, and component construction was developed and described in the main paper and Enclosure 1. The staff recognizes that the advanced reactor operational program requirements may likely vary significantly from the operational program requirements for large light-water reactors. Similarly, the staff anticipates that security program requirements may differ significantly from current programs based on the anticipated advanced reactor deployment models. This will warrant a new approach to these inspections. The staff will communicate to the Commission its plans to inspect these programs before implementation.

The oversight of security and safeguards for advanced reactor construction will be described in Inspection Manual Chapter 2203, which will provide a structured framework for evaluating security features of advanced reactors during construction. The structured framework will ensure compliance with regulatory requirements and verify that security and safeguards measures address both internal and external threats using a risk-informed, performance-based methodology. The oversight program will incorporate lessons learned from past U.S. Nuclear Regulatory Commission (NRC) oversight efforts, including AP1000 construction.

Advanced reactor construction oversight of security and safeguards programs and design features will include a risk-informed scoping methodology for construction projects using the requirements set forth in the license, including Inspections, Test, Analyses, and Acceptance Criteria when applicable, to guide oversight. This approach will,

- focus oversight on unique and risk-significant security features;
- allow inspectors to prioritize inspection samples based on risk, starting with the most critical areas;
- verify adequate security and safeguards for advanced reactor plants; and
- support efficient resource use.

Use of New Technology

The staff is in the early stages of determining how and when to use new technology to supplement its inspection and oversight programs for the construction of advanced reactors. Although the commercial nuclear industry has indicated that it plans to introduce manufacturing and construction techniques that may be conducive to remote monitoring, it is not yet clear what types of information from remote monitoring and similar technologies will be available to the staff and how this information could be leveraged to gain inspection efficiencies.

The staff is open to the use of new technology to achieve inspection efficiencies; assumes there will be improvements, such as in the use of technology and automation; and will seek ways to use them to gain inspection and oversight efficiencies in the future.

Coordination with Foreign Regulators

The staff envisions leveraging all available information related to domestic and international vendor and manufacturer oversight to inform the ARCOP inspection scope and provide the NRC staff with additional performance monitoring data. One such opportunity is building on NRC interactions with the Canadian Nuclear Safety Commission (CNSC). On March 12, 2024, the

NRC, the CNSC, and the United Kingdom Office for Nuclear Regulation (ONR) signed a memorandum of cooperation (MOC) (Agencywide Documents Access and Management System (ADAMS) Accession No. ML24066A026) to increase collaboration on the technical reviews of advanced reactor and small modular reactor technologies. The staff plans to engage in future discussions with the CNSC, the ONR, and other foreign regulatory bodies to further cooperation in inspection and oversight of advanced reactor construction activities. The Nuclear Energy Agency may provide a viable conduit for additional international cooperation using an infrastructure similar to the Committee for Nuclear Regulatory Activities and its Working Group on Supply Chain.

This cooperation builds on the precedent set during construction of the AP1000 plants, when multiple international regulators visited the Virgil C. Summer Nuclear Station and Vogtle construction sites to observe and understand the Construction Reactor Oversight Process (cROP). The NRC has also participated in other inspector exchange programs, including with regulators from the Finnish Radiation and Nuclear Safety Authority and the National Nuclear Safety Administration of China (NNSA). Specifically, as part of the agreement in the MOCs with the NNSA signed in 2008 (ML081050289) and 2010 (ML11175A265), the NRC and the NNSA participated in an inspector exchange program. This allowed NRC inspectors to gain valuable experience and insights for future inspection activities of the AP1000 units that, at the time, were under construction in the United States. The NRC staff observed construction, preoperational testing, and startup testing for the AP1000s being built in China over approximately 7 years. The staff plans to continue such exchanges once advanced reactor construction begins in the United States and other countries. As it develops specific program details, the NRC staff will seek Commission direction on any identified policy issues.

Performance Indicators

The ROP assessment program collects information from inspections and performance indicators (PIs) for each operating unit to enable the agency to arrive at objective conclusions about the licensee's safety performance. The staff considered the development of construction PIs as a means of measuring licensee performance in the cROP. As previously reported to the Commission in SECY-10-0140, dated October 26, 2010, the staff did not identify any PIs for use in the cROP.

The staff will continue to monitor the industry's use of PIs and will consider international construction experience to determine if PIs can be developed and used as an input to the assessment of performance. The staff is mindful that the potential for significant offsite activities may represent a consideration specific to advanced reactors that would lend itself to the development of PIs for use in the assessment program. While the staff is not recommending the development and implementation of construction PIs during the initial ARCOP implementation, it will continue to evaluate and solicit input from stakeholders regarding their development and use as experience is gained with advanced reactor construction.