

NRC INSPECTION MANUAL

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INSPECTION MANUAL CHAPTER 2570

ADVANCED REACTOR CONSTRUCTION OVERSIGHT PROGRAM BASIS DOCUMENT

Effective Date: TBD

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2570-01 PURPOSE

The purpose of this Inspection Manual Chapter (IMC) is to document the basis for significant decisions reached by the Nuclear Regulatory Commission (NRC) staff during the development of the Advanced Reactor Construction Oversight Program (ARCOP) for commercial nuclear power plants. This document shall serve as the basis for all applicable ARCOP program documents such as IMCs, Inspection Procedures (IPs), the Assessment Program, the Enforcement Program, and the Significance Determination Process (SDP).

2570-02 OBJECTIVES

- 02.01 To provide the ARCOP basis and other background information associated with the NRC's oversight of Advanced Reactor (AR) construction.
- 02.02 To describe ARCOP programs and processes.

2570-03 APPLICABILITY

- 03.01 This IMC is applicable to all ARCOP governing documents.
- 03.02 This IMC is applicable to the fabrication, manufacture, and construction of all commercial advanced nuclear reactors, including SMRs and microreactors incorporating both light water reactor (LWR) and non-LWR technologies, and large LWR or non-LWRs with enhanced safety features. Activities under this IMC may begin when an application for the manufacture or construction of an advanced power reactor facility has been submitted to the NRC and accepted/docketed by the NRC for review. This includes applications for a CP, LWA, COL, or ML.
- 03.03 This IMC shall be coordinated with the vendor inspection program (VIP) to ensure inspection scopes do not overlap and that both licensed manufacturers (ML holders) and non-licensed project vendors are clearly scoped into the ARCOP.
- 03.04 This IMC is no longer applicable to an advanced reactor once the advanced reactor has been transferred to the operating reactor oversight process (ROP).

2570-04 DEFINITIONS

04.01 General Program Definitions

- a. Advanced Reactor. The Nuclear Energy Innovation and Modernization Act (NEIMA) defines an advanced reactor as a nuclear fission or fusion reactor, including a prototype plant (as defined in sections 50.2 and 52.1 of title 10, Code of Federal Regulations (10 CFR), with significant improvements compared to commercial nuclear reactors under construction as of the date of enactment of the Act, including improvements such as:
 - 1) additional inherent safety features;
 - 2) significantly lower levelized cost of electricity.
 - 3) lower waste yields;

- 4) greater fuel utilization;
- 5) enhanced reliability;
- 6) increased proliferation resistance;
- 7) increased thermal efficiency; or
- 8) ability to integrate into electric and nonelectric applications.

Examples include small modular reactors (SMRs) and microreactors incorporating both light water reactor (LWR) and non-LWR technologies, and large LWR or non LWR technologies with additional inherent safety features, such as AP-1000.

- b. Advanced Reactor Construction Project. The fabrication, manufacturing and construction of one or more commercial advanced reactors intended to be operated by the same licensee at a common location. A reactor construction project includes fabrication activities performed at a non-licensed project vendor facility, reactor manufacturing activities at a manufacturing facility, and reactor construction at its final resting place, as applicable.
- c. ARCOP Information Management System (AIMS). An information technology platform used to aid in planning, implementing, and tracking advanced reactor fabrication, manufacturing and construction inspections.
- d. Combined License (COL). A combined construction permit and operating license with conditions for a nuclear power facility issued under subpart C of 10 CFR 52.
- e. Construction Permit (CP). A Commission authorization to proceed with construction of a production or utilization facility.
- f. Early Site Permit (ESP). A Commission approval for a site for one or more nuclear power facilities. An early site permit is a partial construction permit.
- g. Limited Work Authorization (LWA). The authorization provided by the Director of the Office of Nuclear Reactor Regulation under 10 CFR 50.10. An LWA allows specific construction activities prior to receiving approval of a CP or COL.
- h. Manufacturing License (ML). A license authorizing the manufacture of nuclear power reactors but not their construction, installation, or operation at the sites on which the reactors are to be operated.
- i. Operating License (OL). A Commission authorization to proceed with operation of a production or utilization facility.
- j. Project Vendor. A non-licensed entity that fabricates nearly complete reactor plants or significant portions of safety-significant system modules under contract to an NRC licensee, NRC permit holder, or an applicant for an NRC license or permit.
- k. Quality. The application of quality assurance (QA) during the design, fabrication, manufacture, construction, and testing of plant structures, systems, and components (SSCs). Adequate quality during construction ensures that nuclear plant SSCs are built according to their approved licensing basis (i.e., “predetermined requirements”) and will perform satisfactorily.

- l. Reactor Manufacturer. An ML holder that produces complete reactor plants (e.g., microreactors), or nearly complete reactor plants (e.g., SMR power modules). A reactor manufacturer may produce reactors for multiple reactor construction projects.
- m. Traditional Vendor. For the purposes of ARCOP, traditional vendors are non-licensed entities that supply basic components such as material, equipment, components, or services to a project vendor, manufacturer, licensee, or applicant to be used in an NRC-licensed facility or activity. In certain cases, the vendor may be an NRC licensee (e.g., a nuclear fuel fabricator) or the product may have NRC certificates (e.g., a transportation cask). Traditional vendors may include suppliers of basic components or third-party commercial grade dedicating entities. Traditional vendors are inspected under the VIP. See the definition for “project vendor” for an explanation of the difference between a project vendor inspected under the ARCOP and a traditional vendor inspected under the VIP.
- n. Vendor Inspection Program (VIP). The NRC inspection program that verifies applicants and licensees are fulfilling their regulatory obligations with respect to providing effective oversight of the nuclear supply chain for both operating reactors and new reactor design and construction activities through a strategic sample of vendor inspections.

04.02 Regulatory Framework Definitions

- a. Cornerstones of Safety. The most important elements in the strategic performance areas that form the foundation for meeting the overall agency mission. For the ARCOP, the cornerstones of safety are the Fundamental Safety Functions (Reactivity Control, Heat Removal, and Radionuclide Retention), Safeguards and Security Programs, and Operational Programs. These cornerstones form the third level of the ARCOP regulatory oversight framework.
- b. Fundamental Safety Functions (FSFs). A set of high-level functions that serve to limit the release of radioactive materials to within established limits over the entire range of licensing basis events. FSFs are discussed in various references, such as in Nuclear Energy Institute (NEI) 18-04, Revision 1, "Risk-Informed Performance-Based Technology Inclusive Guidance for Non-Light Water Reactor Licensing Basis Development," (endorsed by Regulatory Guide 1.233). The FSFs are common to all reactor designs and therefore provide a technology-inclusive oversight framework. The FSFs are:
 - 1. Reactivity Control
 - 2. Heat Removal (including reactor and spent fuel decay heat and heat generated from waste stores), and
 - 3. Radionuclide Retention.
- c. Regulatory Framework. A top-down, hierarchical approach to construction project oversight. The first level of the framework is the NRC's overall mission to protect public health and safety by enabling the safe and secure use and deployment of civilian nuclear energy technologies and radioactive materials through efficient and reliable licensing, oversight, and regulation for the benefit of society and the environment during advanced reactor fabrication, manufacturing, and/or construction. The second level of the framework consists of strategic performance areas, which reflect those areas of

fabrication, manufacturing, and/or construction performance for which the NRC has regulatory responsibility in support of the overall agency mission. The third level of the framework consists of cornerstones, which are the most important elements in the strategic performance areas that form the foundation for meeting the overall agency mission.

- d. Strategic Performance Area. Aspects of performance that are important to the NRC mission and therefore merit regulatory oversight. For the ARCOP, the strategic performance areas are Quality of Reactor Plant Construction, Safeguards and Security, and Operational Readiness. These strategic performance areas form the second level of the ARCOP regulatory oversight framework.

04.03 Performance Monitoring Definitions

- a. ARCOP Construction Inspection Program (ACIP). The ACIP consists of advanced reactor inspections in the following instances and/or areas: (1) preconstruction, (2) corrective action program (CAP) effectiveness review inspections, (3) baseline inspection during the fabrication, manufacturing, and construction of advanced reactors, and to inspect security and operational programs, (4) supplemental inspections, and (5) reactive inspections.
- b. Audit. For the purposes of ARCOP, an audit is a review of an operational program prior to its implementation. A review of an operational program after its implementation is an inspection.
- c. Baseline Inspection Program (BIP). A risk-informed, performance-based inspection program that is conducted at all advanced nuclear power reactors being fabricated, manufactured and/or constructed. The BIP is the minimum inspection effort necessary and will be completed for each unit under construction to inform the Commission's operational findings under 10 CFR 50.57 or 10 CFR 52.103(g).
- d. Design-Specific Inspection Scoping Matrix. A matrix that includes the quality of reactor plant construction strategic performance area portion of the baseline inspection plan for a specific advanced reactor design. The design-specific matrix identifies the safety-related and safety-significant SSCs/ITAAC for a specific design (i.e., matrix rows) and the inspection areas (i.e., matrix columns) that are applicable to the reactor plant design. AIMS is typically used to create, save, and edit design-specific matrices.
- e. Direct Observation Techniques. Direct observation includes observing in-process construction or manufacturing-related activities such as fabrication, qualification, assembly, installation, inspection, examination, and testing to determine if the activity was performed in accordance with the licensing basis and appropriate work control documents (e.g., applicable instructions, procedures, and/or drawings).
- f. Project-Specific Inspection Scoping Matrix. A matrix that includes the quality of reactor plant construction strategic performance area portion of the baseline inspection plan for a specific reactor project. Project-specific matrices are typically created in AIMS using the design-specific matrix as a starting point, updated based on construction and operating experience from previous deployments, and then adjusted to include applicable site-specific safety-related and safety-significant SSCs/ITAAC.

- g. Record Review. Record review includes review of a sample of completed quality records to determine if the construction, fabrication, or manufacturing-related work activity was performed in accordance with the licensing basis and the appropriate applicable instructions, procedures, and drawings. For the records reviewed, inspectors should determine if records are adequate to furnish evidence that activities affecting quality were performed correctly. If possible, the inspectors should also perform a walk-down of the completed work activity associated with the records reviewed, to determine whether the as-built SSC conforms with the final design, fabrication, manufacturing and construction documents, and the records reviewed.
- h. Risk and Risk Assessment. The risk definition takes the view that when one asks, "What is the risk?" one is really asking three questions: "What can go wrong?" "How likely is it?" and "What are the consequences?" These three questions can be referred to as the "risk triplet." The traditional definition of risk, that is, probability times consequences, is fully embraced by the "triplet" definition of risk. A risk assessment is a systematic method for addressing the risk triplet as it relates to the performance of a particular system (which may include a human component) to understand likely outcomes, sensitivities, areas of importance, system interactions and areas of uncertainty. From this assessment the important scenarios can be identified.
- i. Risk-Informed, Performance-Based Inspection. A risk-informed, performance-based approach to inspection is an approach in which risk insights, engineering analysis, and judgment, including the principle of defense-in-depth and the incorporation of safety margins, and performance history are used, to (1) focus attention on the most important activities, (2) establish objective criteria for evaluating performance, (3) develop measurable or calculable parameters for monitoring system and licensee performance, (4) provide flexibility to determine how to meet the established performance criteria in a way that will encourage and reward improved outcomes, and (5) focus on the results as the primary basis for regulatory decision-making.

04.04 Dispositioning Findings Definitions

- a. Administrative Actions. Actions such as confirmatory action letters, notices of deviation, and notices of nonconformance, that are issued to supplement the NRC enforcement program. These administrative actions are explained in the Enforcement Manual. The NRC expects licensees and other persons subject to the Commission's jurisdiction to adhere to any obligations and commitments resulting from administrative actions and will consider issuing additional Orders, as needed, to ensure compliance.
- b. Apparent Violations (AVs). Issues that do not appear to meet NRC requirements and for which the NRC staff has not made a final enforcement determination.
- c. ARCOP Significance Determination Process (SDP). The process described in this IMC that is applied to an ARCOP inspection finding to determine its safety or security significance as either green (very low), white (low-to-moderate), or yellow (substantial).
- d. Escalated Enforcement Actions. Severity Level (SL) I, II, and III NOVs; NOVs associated with an inspection finding that the SDP evaluates as having low to moderate (white) or greater safety significance; civil penalties; NOVs to individuals; Orders to modify, suspend, or revoke NRC licenses or the authority to engage in NRC-licensed activities; and Orders issued to impose civil penalties.

- e. Finding. (1) A performance deficiency that is of more-than-minor significance where the performance deficiency is reasonably foreseeable and preventable. In this general context of the word, “finding” is usually spelt with a small “f,” and (2) the final disposition of certain findings that are not associated with violations. In this specific context, “Finding” is spelt with a capital “F” and is abbreviated as “FIN.”
- f. Minor Noncompliance. A Noncompliance that has little or no safety or security significance, is less significant than green or severity level (SL)-IV and generally does not warrant enforcement action or documentation in inspection reports. Minor noncompliances must be corrected, but the NRC does not formally track their completion or closure. Minor noncompliances may be documented in certain circumstances (see IMC 0618, “Advanced Power Reactor Construction Inspection Reports,” for guidance on documentation of minor noncompliances).
- g. Non-Cited Violation (NCV). A method for dispositioning a SL IV violation or a violation associated with a green finding that meets the criteria in section 2.3.2 of the Enforcement Policy.
- h. Noncompliance. The failure to adhere to a legally binding requirement or a non-legally binding commitments and standards. Legally binding requirements include regulations, technical specifications, license conditions, and NRC Orders. Non-legally binding commitments and standards include, commitments made to the NRC, self-imposed requirements to establish and maintain quality, and requirements specified in procurement contracts.
- i. Non-Escalated Enforcement Action. NOVs that are dispositioned by the NRC as SL IV or minor violations.
- j. Notice of Deviation (NOD). A written notice describing a licensee’s failure to satisfy a commitment where the commitment involved has not been made a legally binding requirement. An NOD requests that a licensee provide a written explanation or statement describing corrective steps taken (or planned), the results achieved, and the date when corrective action will be completed.
- k. Notice of Nonconformance (NON). Is a written notice describing the failure of a licensee’s contractor to meet contract requirements that have not been made legally binding requirements by the NRC (e.g., a procurement contract with a licensee or applicant as required by 10 CFR Part 50, Appendix B). NONs request that non-licensees provide written explanations or statements describing corrective steps (taken or planned), the results achieved, the dates when corrective actions will be completed, and measures taken to preclude recurrence.
- l. NRC-Identified Noncompliance. A noncompliance that is found by NRC inspectors, of which the licensee was not previously aware, or had not been previously documented in the organization’s quality assurance program (QAP). NRC-identified noncompliances also include previously documented noncompliances to which the inspector has significantly added value. Added value means that the inspector has identified a previously unknown significant weakness in the classification, evaluation, or corrective actions associated with the noncompliance.

- m. Performance Deficiency. A noncompliance that was reasonably within the licensee's/applicant's/project vendor's ability to foresee and correct and should have been prevented.
- n. Quality Assurance Program (QAP) Backstop. A planned QAP activity meant to detect SSC deficiencies or noncompliances that are associated with a finding, such as preservice inspections and tests, post-construction tests, and Initial Test Program activities.
- o. Self-Identified Construction Noncompliance (SCN). A project vendor, manufacturer, or construction noncompliance that is self-identified and corrected through the QAP by a licensee or project vendor and is neither NRC-identified nor self-revealing. SCNs include but are not limited to noncompliances identified and corrected by the licensee or project vendor during routine fabrication, manufacturing, or construction activities; QA activities including self-assessments, independent assessments, audits, and surveillances; preoperational, hydrostatic, and nondestructive testing; and emergency preparedness (EP) drills and critiques conducted by or for a licensee.
- p. Self-Revealing Noncompliance. A noncompliance that becomes self-evident and requires no active and deliberate observation by licensees, non-licensees, or NRC inspectors to determine whether a change in process or equipment capability or function has occurred. Self-revealing noncompliances become apparent through a readily detectable degradation in the material condition, capability, or functionality of equipment and require minimal analysis to detect. An example of a self-revealing noncompliance is a noncompliance with radiography exclusion area requirements that is subsequently identified through an electronic dosimeter alarm.
- q. Significance Determination Process (SDP). The process that is applied to an ARCOP inspection finding to determine its safety or security significance as either green (very low), white (low-to-moderate), or yellow (substantial).
- r. Technical Assistance Request (TAR). The TAR process provides a means for NRC inspection staff to request assistance from other NRC organizations when dispositioning inspection issues. See COM-106, Technical Assistance Request Process, for guidance on initiating and completing TARs.
- s. Very Low Safety Significance Issue Resolution (VLSSIR). A process used to discontinue inspection of an issue involving an open question that has ambiguity in the licensing basis, design basis, or applicability of regulatory requirements in which: (1) the resolution of the issue would require considerable staff effort; and (2) the agency has chosen to not expend further effort to resolve the question because the issue would be no greater than Green under the ARCOP or SL IV under the traditional enforcement process, if resolved.

04.05 Assessment Program Definitions

- a. Assessment Letter. A letter from the NRC to a licensee or non-licensee that communicates assessment-related information.
- b. Finding Response Table (FRT). A table consisting of four columns representing increasing levels of response based on the safety-significance of inspection findings. The FRT categorizes the safety-significance of findings; identifies the range of expected

actions for the finding; identifies the NRC response; and describes the appropriate level of communication.

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2570-05 RESPONSIBILITIES AND AUTHORITIES.

The final organizational structure for ARCOP implementation has not been determined. Current ARCOP IMC drafts are modeled after the organization implemented for the cROP. Changes will be made to roles and responsibilities if/when future NRC organizational changes are made.

05.01 Director, Division of Advanced Reactors and Non-Power Production and Utilization Facilities (DANU) (NRR)

Responsible for the content of the basis document.

05.02 Chief, Advanced Reactor Policy Branch (UARP)

- a. Responsible for periodic updates to IMC 2570 in accordance with IMC 0040, "Preparation, Revision, Issuance, and Ongoing Oversight of NRC Inspection Manual Documents."
- b. When making changes to other IMCs, or applicable ARCOP documents, those changes shall be reviewed and considered for possible inclusion in this IMC.

2570-06 REQUIREMENTS

This document shall serve as the basis for all applicable ARCOP program documents such as IMCs, IPs, the Assessment Program, the Enforcement Program, and the SDP. Revisions to ARCOP governance documents shall not conflict with this IMC.

2570-07 GUIDANCE

07.01 Introduction

The NRC has long anticipated the need to be prepared to license and oversee the construction and operation of ARs. The Commission first published a policy statement on the regulation of ARs in 1986. The policy was subsequently updated in 1994 and again in 2008. The policy states that the Commission expects that advanced reactors will provide enhanced margins of safety and/or use simplified, inherent, passive, or other innovative means to accomplish their safety and security functions but does not further specify whether ARs are LWRs or non-LWRs.

In preparation for the licensing and regulation of a new generation of non-LWRs, on January 3, 2017, the staff issued the document, "Vision and Strategy for Safely Achieving Effective and Efficient Non-Light Water Reactor Mission Readiness" (non-LWR Vision and Strategy Document) (ADAMS Accession No. ML17164A173). The non-LWR Vision and Strategy Document outlines how the NRC is preparing for and would subsequently regulate non-LWR technologies by developing plans to enhance technical readiness, optimize regulatory readiness, and optimize communications. While much of the efforts to implement strategies for advanced reactors has been focused on their application to non-LWR designs, the efforts are equally applicable to LWR designs.

To achieve the goals and objectives stated in the non-LWR Vision and Strategy Document, the staff developed the Non-Light Water Reactor Near-Term Implementation

Action Plans (ML17165A069) and Non-Light Water Reactor Mid-Term and Long-Term Implementation Action Plans (ML17164A173), which were both issued in July 2017. The strategies and contributing activities necessary to achieve the strategic objectives are binned in near-term (0-5 years), mid-term (5-10 years) and long-term (beyond 10 years) timeframes. The mid-term implementation action plan for the non-LWR Vision and Strategy Document contains Strategy 1, "Continue to acquire/develop sufficient knowledge, technical skills and capacity to perform regulatory reviews and to conduct oversight of non-LWRs," Contributing Activity No. 2, "Adapt construction inspection and the construction reactor oversight process to non-LWRs." An outcome from this activity is the issuance of program and guidance documents to support the NRC inspection of manufacturing and construction associated with non-LWR designs. As previously mentioned, non-LWR efforts are equally applicable to LWR designs.

Many of the goals outlined in these documents relate to requirements in section 103 of the NEIMA (Nuclear Energy Innovation and Modernization Act), which was signed into law on January 14, 2019. The NEIMA revises the budget and fee structure of the NRC and requires the NRC to develop new processes for licensing nuclear reactors.

The ADVANCE Act of 2024 (Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy Act of 2024) was signed into law in July 2024. Section 507 of the ADVANCE Act required the NRC to submit to Congress a report that identifies specific improvements to the nuclear reactor oversight and inspection programs carried out pursuant to the Atomic Energy Act of 1954 that the Commission may implement to maximize the efficiency of such programs through, where appropriate, the use of risk-informed, performance-based procedures, expanded incorporation of information technologies, and staff training.

To fulfill the requirements of the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.), as amended, NRC regulations allow license applicants to construct and operate production or utilization facilities pursuant to (1) a two-step licensing process, consisting of a construction permit (CP) followed by an OL, or (2) a one-step licensing process consisting of a combined operating license (COL). These processes require NRC to verify that the plant has been constructed and will operate in accordance with its licensing basis prior to issuance of an OL per 10 CFR 50.57(a)(1) or allowance of operation per 10 CFR 52.103(g). In both cases, construction oversight is used to inform these licensing decisions. For construction of recent AP1000 plants, which employed the one-step licensing process, the staff implemented the Construction Reactor Oversight Process (cROP) to provide confidence that licensee's ITAAC completion and verification processes are effective and provide reasonable assurance that licensee ITAAC completion notifications are sufficient and accurate.

Since cROP development and implementation, new reactor construction interest has grown to include large LWRs, SMRs and microreactors using both LWR and non-LWR technology. While the cROP provided effective oversight for the construction of large LWRs under a COL, given the expected diversity of advanced reactor projects and deployment models, including both the one-step and two-step licensing processes, the staff communicated its intent to take a fresh look at construction oversight through development of the ARCOP to the Commission in SECY-23-0048, "Vision for the Nuclear Regulatory Commission's Advanced Reactor Construction Oversight Program," dated June 6, 2023 (ML23061A086).

The staff established an Advanced Reactor Construction Advisory Committee (ARCAC) of Nuclear Regulatory Commission (NRC) leadership to assist the staff in developing and communicating the ARCOP. Under the direction of the ARCAC, the staff applied the guiding principles discussed in SECY-23-0048 and the lessons learned documented in “10 CFR Part 52 Construction Lessons-Learned Report,” dated January 16, 2024 (ML23325A202), to develop the ARCOP regulatory framework and the ARCOP elements of inspection, dispositioning issues, and assessment. In developing these ARCOP elements, the staff solicited and incorporated internal and external stakeholder feedback obtained through:

- Internal Tabletop Exercises
- ARCAC briefings, discussions, and alignment
- Benchmarking with the Department of Energy and the National Aeronautics and Space Administration; and
- Public Workshops (February 28, March 20, April 3, May 22, and July 17, 2024).

The resulting advanced reactor construction oversight program (the ARCOP) is a significant improvement to new reactor construction oversight implemented at Vogtle Units 3 and 4 and supersedes the cROP.

The ARCOP development began with the non-LWR Vision and Strategy Document mid-term implementation action plan for Strategy 1, Contributing Action 2. The ARCOP also meets the intent for the NRC to 1) be ready for advanced reactor oversight outlined in the NEIMA, 2) make improvements to NRC construction oversight as required in the ADVANCE Act, Section 507, and 3) implement efficiency gains as required in Executive Order 14300, “Ordering the Reform of the Nuclear Regulatory Commission.”

The staff informed the Commission in SECY-25-00XX, “Update on Development of the U.S. Nuclear Regulatory Commission’s Advanced Reactor Construction Oversight Program,” dated XXXX XX, 202X (MLXXXXXXXXXX) that ARCOP development was nearly complete with only limited work remaining, and that the staff would be ready to implement the program when fabricating, manufacturing, and/or construction activities warrant regulatory oversight.

07.02 Background

- a. The NRC developed the ARCOP to be implemented at all advanced commercial nuclear reactors under construction, including commercial SMRs and microreactors incorporating both LWR and non-LWR technologies. Because ARCOP was developed consistent with its guiding principles to be risk-informed, performance-based, technology-inclusive, and scalable, ARCOP oversight will also apply to future construction of large LWRs with enhanced safety features, such as the AP1000.
- b. The objective for developing the various components of this oversight program is to provide tools for inspecting and assessing licensee performance and enforcing NRC requirements in a manner consistent with the ARCOP guiding principles and the principles of good regulation (independence, openness, efficiency, clarity, and reliability). The ARCOP improves upon the cROP and incorporates lessons learned from the implementation of the cROP at Vogtle Units 3 and 4.

- c. The staff envisions three scenarios to which it will apply the ARCOP:
 - 1. Offsite manufacturing of power reactors by a manufacturing license (ML) holder,
 - 2. Offsite fabrication and assembly of reactor modules and/or nearly complete reactor plants by a project vendor under contract with a COL or CP holder, and
 - 3. Onsite power reactor construction by a COL or CP holder.

Under ARCOP, when an entity has an ML, they are referred to as a manufacturer and will likely construct complete reactor plants or reactor modules in factories. Pertinent NRC oversight activities associated with factory manufacturing will fall within the scope of ARCOP. Additionally, the staff expects factory fabrication and assembly of modules and/or nearly complete reactor plants by project vendors. While these activities may be performed without license, the NRC staff determined it would be more efficient and effective for the staff to oversee in-situ factory fabrication and assembly under ARCOP. In-situ factory oversight provides direct observation of safety-significant work which provides the NRC more performance information, a better assessment of quality, and reduces the need for extensive review of work documentation (i.e., paperwork).

It is anticipated that for many advanced reactor applications, fewer risk-significant construction activities will occur onsite than was inspected under the cROP. Including manufacturers and project vendors under the ARCOP ensures appropriate NRC oversight of pertinent activities and provides for increased efficiency by scaling inspection footprints of individual projects.

07.03 ARCOP Regulatory Oversight Framework

The staff used a hierarchical approach to develop the ARCOP regulatory oversight framework that addresses the agency's regulatory principles, as shown in Exhibit 1. The regulatory framework is a risk-informed, tiered approach to providing reasonable assurance that the facility has been constructed and will operate in conformity with the license. The framework starts at the highest level, with the NRC's overall mission. There are three key strategic performance areas and within each strategic performance area are cornerstones that reflect the essential aspects of facility construction. Acceptable performance in the cornerstones, as measured by the risk-informed ARCOP BIP, provides reasonable assurance that the facility has been constructed and will be operated in conformity with the license and thus, assures the public health and safety. Within this framework, the NRC's ARCOP provides a means to collect information about licensee performance, assess the information for its significance, and provide for appropriate response.

- a. NRC Mission

The NRC protects public health and safety and advances the nation's common defense and security by enabling the safe and secure use and deployment of civilian nuclear energy technologies and radioactive materials through efficient and reliable licensing, oversight, and regulation for the benefit of society and the environment.

- b. Strategic Performance Areas

To meet the ARCOP objective to provide reasonable assurance that advanced reactors will be built and operated in accordance with their licensing and design bases, the

Atomic Energy Act of 1954 (as amended), and the NRC's rules and regulations, the staff identified three broad areas of licensee performance that are important to the mission and therefore merit regulatory oversight. These areas of licensee performance are represented in the framework structure as the strategic performance areas and form the second level of the regulatory oversight framework:

1. Quality of Reactor Plant Construction;
2. Security and Safeguards; and
3. Operational Readiness.

c. Cornerstones

With a risk-informed perspective, the staff then identified the most important elements in each of these strategic performance areas that form the foundation for meeting the overall agency mission. These elements were identified as the cornerstones of safety in the third level of the regulatory oversight framework. These cornerstones serve as the fundamental building blocks for the ARCOP, and acceptable licensee performance in these cornerstones provides reasonable assurance that the overall mission is met. The cornerstones and their objectives are:

1. Quality of Reactor Plant Construction Strategic Performance Area

The cornerstones in the quality of reactor plant construction strategic performance area are the three FSFs common to all reactor technologies¹, ensuring a technology-inclusive framework. Orienting the quality of reactor plant construction strategic performance around the FSF cornerstones enables efficient and effective scoping by integrating inspection efforts, whether on or off site. Additionally, orienting around FSF cornerstones allows simple, risk-informed screening of inspection issues that accounts for unique features of advanced reactors. The staff anticipates that SSCs associated with reactor safety described in license applications will align well with the FSFs based on existing regulatory requirements. They are reactivity control, heat removal from the reactor and spent fuel, and radionuclide retention.

2. Security and Safeguards Strategic Performance Area

The security and safeguards strategic performance area has one cornerstone – security programs. The objective of the security programs cornerstone is to gain reasonable assurance that adequate construction and operational security programs

¹ FSFs are based on the descriptions in International Atomic Energy Agency (IAEA) safety standards. IAEA SSR-2/1, revision 1, "Safety of Nuclear Power Plants: Design" is one example.

are in place or being developed in accordance with regulations to safeguard nuclear installations and special nuclear material.

3. Operational Readiness Strategic Performance Area

The operational readiness strategic performance area has one cornerstone - operational programs. The cornerstone objective is to gain reasonable assurance that licensees adequately develop and implement the operational programs required by license conditions and regulations.

07.04 ARCOP Elements

Like other NRC reactor oversight programs, the ARCOP includes the elements of performance monitoring, dispositioning findings through a risk-informed SDP and application of the NRC Enforcement Policy, and performance assessment. An overview of the ARCOP and the interaction between ARCOP processes is shown in Exhibit 2. The BIP will be completed for each unit under construction to inform the Commission's findings under 10 CFR 50.57 or 10 CFR 52.103(g), as applicable. The BIP will provide the insights necessary to assess performance in the three cornerstones regarding the quality of reactor plant construction.

a. Performance Monitoring

The NRC staff primarily monitors performance through the ACIP. Most ACIP inspections are conducted to complete the ARCOP BIP. Resident inspectors could be assigned to certain AR construction projects if it is determined that more effective and efficient oversight can be performed with continuous onsite NRC presence. However, with the anticipated inspection footprint under ARCOP, construction resident inspectors won't be necessary.

The ACIP is primarily a risk-informed, performance-based inspection program that emphasizes results (e.g., can the pump perform its intended function?) over process and method (e.g., was the maintenance technician trained?). Construction inspectors are provided the training, tools and guidance to focus on the most risk significant construction activities through a performance-based approach.

While the ACIP focuses on a risk-informed, performance-based inspection approach, this inspection approach does not supplant or displace the need for compliance with NRC requirements, nor does it displace the need for enforcement action, as appropriate, when noncompliance occurs. Not every aspect of licensed activities can or should be inspected using this approach.

For example, testing risk-significant structures to ensure they will withstand design-basis seismic events may not be practical or efficient in certain instances. In such cases, it may be necessary for inspectors to verify that these structures have been constructed in compliance with applicable seismic codes and standards. Additionally, if a licensee or project vendor is unsuccessful in meeting the criteria defined by a performance-based regulation, inspectors may then focus on the process and method to understand the cause of the breakdown in performance, and to understand how future noncompliances may be avoided.

The ACIP consists of inspections of the following activities:

1. Pre-construction inspections following (1) the acceptance and docketing of an application for an LWA or CP submitted under 10 CFR Part 50, or an application for an ESP, COL, or ML submitted under 10 CFR Part 52, and (2) implementation of the QA program during safety-significant pre-construction activities performed by the applicant and its contractors. Pre-construction inspection requirements are described in detail in IMC 2501, "Inspection Activities Following Acceptance of a Docketed Application for a Permit, License, or NRC Authorization." Pre-construction inspections are not part of the ARCOP BIP but may be used to inform the BIP scope.
2. A fundamental goal of the NRC's oversight of new construction activities is to establish confidence that licensees (and their contractors) are detecting and correcting problems in a manner that ensures quality and safety are top priorities and that construction activities will be completed in a manner that ensures each plant is constructed in accordance with the design and will operate safely. The use of NCVs for self-revealing and NRC-identified violations as part of the enforcement process is predicated on a licensee having an adequate CAP into which identified issues are entered and effectively resolved in a timely manner.

Inspection of project vendor, manufacturers, and licensee CAP effectiveness will be performed as part of each baseline inspection and assessed in accordance with IMC 2572.

3. Baseline inspections during the fabrication, manufacturing, and construction of advanced reactors.

The BIP is scalable so that it results in a planned inspection footprint that is commensurate with the expected risk posed by advanced reactor facilities and, based on lessons learned from implementing the cROP, allow for more efficient execution by providing necessary flexibility. The ARCOP BIP is the minimum inspection effort necessary to verify the cornerstone objectives are met, thereby ensuring that the facility has been constructed and will operate in conformity with the licensing bases. The BIP will be completed for each unit under construction to inform the Commission's findings under 10 CFR 50.57 or 10 CFR 52.103(g), as applicable.

Under the cROP, the staff selected, or targeted, specific ITAAC for inspection, and these ITAAC had to be inspected to complete the BIP. As stated in the "10 CFR Part 52 Construction Lessons-Learned Report," this practice, coupled with NRC reviews of ITAAC closure notifications (ICNs), provided the staff reasonable assurance that the facilities were built and would operate in accordance with their approved designs and licensing bases for Vogtle Units 3 and 4. However, a key lesson was that the NRC's process for targeting ITAAC was too prescriptive and did not provide for a flexible or user-friendly means to make adjustments when planned inspections could not be performed due to unexpected circumstances (e.g., construction schedule changes).

For the quality of reactor plant construction strategic performance area, the ARCOP will not identify a set of targeted ITAAC or SSCs to inspect. Instead, ARCOP will provide a range of inspection opportunities from which the staff can select, informed by risk insights and availability during the scheduled inspection. This approach is expected to result in more efficient use of staff resources while ensuring that a representative sample of construction activities is inspected to verify that cornerstone objectives are met. This methodology draws on the experience from the ROP, where

guidance is provided for sample selection, and inspectors are provided with the flexibility to select the specific items to sample.

Flexibility is provided by a scoping and planning tool referred to as an “inspection scoping matrix” that organizes project vendor, manufacturer, and construction activities into inspection areas based on SSC and construction/manufacturing process commonalities. For each unique advanced reactor design, the staff will develop a design-specific inspection scoping matrix, which will be used to develop project-specific inspection scoping matrices. These project-specific matrices take into consideration site- or project-specific information and consider safety-significant activities that are performed by project vendors, manufacturers, or permit/license holders, as appropriate. Applicant and/or licensee insights into the design and specific fabrication and manufacturing techniques are used to gauge the complexity and industry experience associated with specific activities and will be considered when developing the inspection scoping matrix.

Scalability is achieved in the inspection scoping matrix through the number of inspection areas and adjustment of the minimum and maximum sample sizes assigned to each inspection area. For example, the NRC expects that SMRs and microreactors will have many fewer safety-significant SSCs than a larger commercial power reactor. Consequently, their inspection scoping matrices will include significantly fewer SSCs with correspondingly fewer inspection areas and minimum inspection samples necessary to verify reasonable assurance of construction quality.

Baseline inspection scoping for the security and operational programs cornerstones is not included in the inspection scoping matrix; however, baseline inspection areas in these cornerstones will be tracked alongside matrix inspections in AIMS.

Additional details for baseline inspections in the strategic performance areas can be found as follows:

- a) Project vendor, manufacturer, and construction inspections are conducted as part of the risk-informed, performance-based quality of reactor plant construction strategic performance area BIP. The quality of reactor plant construction BIP inspection requirements are discussed in detail in IMC 2573, “Inspection of the Advanced Power Reactor “Quality of Reactor Plant Construction” Strategic Performance Area,” and are conducted to ensure the reactivity control, heat removal, and radionuclide retention cornerstone objectives are met.
- b) Security program inspections are conducted as part of the risk-informed, performance-based security and safeguards strategic performance area BIP. The security and safeguards strategic performance area BIP requirements are described in detail in IMC 2203, “Security Inspection Program for Advanced Power Reactor Construction,” and are conducted to ensure the security program cornerstone objectives are met.
- c) Operational program inspections and audits are conducted as part of the risk-informed, performance-based operational readiness strategic performance area BIP. The operational readiness strategic performance area BIP inspection and audit requirements are discussed in detail in IMC 2574, “Inspection of the Advanced Power Reactor “Operational Readiness” Strategic Performance Area,”

and are conducted to ensure the operational program cornerstone objectives are met.

4. The NRC will perform supplemental inspections beyond the BIP when safety-significant inspection findings are identified. The supplemental inspections will typically occur at the location where the safety-significant finding was identified. Supplemental inspections are diagnostic in nature and intended to provide assurance that risk-significant inspection findings are resolved.
5. Reactive inspections are conducted in response to specific safety-significant construction events (e.g., a report of significant breakdown of a portion of the QAP per 10 CFR 50.55(e)). Reactive inspections are conducted in accordance with IMC 2574. Reactive inspections are not part of the BIP and are completed on an as-needed basis.

b. Dispositioning Noncompliances

The staff recognizes that noncompliances will occur in a variety of construction activities and will have varying levels of significance. Most noncompliances will be identified during inspections conducted to monitor performance. Noncompliances will be dispositioned in accordance with the process discussed in IMC 2571, "Dispositioning Advanced Power Reactor Construction Noncompliances." This section provides an overview of the process to disposition noncompliances and the bases for new concepts implemented through the ARCOP.

Noncompliances include:

- Violations: defined as failure to comply with a legally binding requirement, such as a regulation, rule, order, license condition, or technical specification.
- Nonconformances: defined as a vendor's or certificate holder's failure to meet contract requirements related to NRC activities (e.g., 10 CFR Part 50, Appendix B) where the NRC has not placed requirements directly on the vendor or certificate holder.
- Deviations: defined, in part, as a licensee's failure to satisfy a written commitment. Commitments are typically non-legally binding requirements.

After a noncompliance is identified, the staff then assesses the significance of a noncompliance by considering:

- Actual safety consequences,
- Potential safety consequences,
- Potential for impacting the NRC's ability to perform its regulatory function, and
- Any willful aspects of the noncompliance.

There are rarely actual consequences associated with fabrication, manufacturing, or construction. Therefore, in SRM-SECY-10-0140, "Staff Requirements—SECY 10 0140—Options for Revising the Construction Reactor Oversight Process Assessment Program," the commission directed that the significance of findings (including more-than-minor

determination) for construction oversight should appropriately characterize finding significance based on risk to operations and should be comparable to risk thresholds in the ROP. Considering this direction and the lessons learned from previous construction oversight that significance determination should not be overly complex or require extensive resources to execute, the staff developed new guidance for ARCOP significance determination.

The ARCOP significance determination process includes recognition that self-identified noncompliances that are corrected pose no risk to reactor operations. Such noncompliances are called self-identified construction noncompliances (SCNs) and will be assigned minor safety significance. Additional examples of minor safety and security concerns are included in IMC 2571. Noncompliances of minor safety or security concern do not warrant enforcement action and are not normally documented in inspection reports. However, these noncompliances must be corrected.

Some NRC-identified findings would likely be identified by the licensee's QAP prior to reactor operations and therefore pose reduced risk to reactor operations. These "QAP backstops" refer to situations where a scheduled QAP activity designed to detect SSC deficiencies or noncompliances is associated with a finding. To credit these QAP backstops, the QAP activities must be (1) reasonably defined or contained in procedures, (2) planned to occur before a finding on the adequacy of an OL application or whether the acceptance criteria in the ITAAC are met, and (3) likely able to detect the deficiency or noncompliance associated with the finding. When a QAP backstop exists, if the ARCOP SDP screening indicates the issue is more than minor significance, the staff would document the issue as green since there is high likelihood that the deficiency or noncompliance would have been identified during the QAP backstop activity and would not have affected reactor operations. In other words, an NRC-identified finding credited with a QAP backstop will screen as green and will not normally be considered as a white or yellow finding.

An example of a QAP backstop is a preoperational system test meant to ensure proper fluid flow in system piping. If there is a deficiency associated with system component installation that would affect the system fluid flow, it would likely be detected during the preoperational test and would be considered a QAP backstop.

Noncompliances of more than minor safety or security concern where the noncompliance is reasonably foreseeable and preventable are considered ARCOP inspection findings. Findings are treated differently depending on the entity (licensee or non-licensee) that is responsible for the finding.

1. Dispositioning ARCOP Inspection Findings Associated with Licensees

ARCOP findings associated with licensees (ESP, LWA, CP, ML, COL, and OL holders) are dispositioned using a process consistent with the NRC Enforcement Policy, Section 2.2.3, "Assessment of Violations Identified Under the ROP or cROP." Findings are divided into two categories: (1) those whose significance can be evaluated under the SDP because they have a direct impact on ARCOP safety cornerstones, and (2) those that are outside the capability of the SDP that are evaluated under traditional enforcement policy.

Most findings associated with licensees are dispositioned using the SDP. Inspection findings processed through the SDP are assigned a color of green, white, or yellow based on increasing risk significance. Findings initially characterized at white, yellow, or

greater-than-green are considered escalated enforcement actions. Since there is no immediate radiological threat to the public from construction activities, the ARCOP does not use red significance findings. Violations associated with ARCOP inspection findings are not normally assigned severity levels, nor are they normally subject to civil penalties, although civil penalties are considered for any violation that involves actual consequences.

If a licensee has implemented a CAP that is determined to be effective by the NRC, the NRC will normally disposition SL IV violations and violations associated with green ARCOP findings as non-cited violations (NCVs) if all the criteria in the NRC Enforcement Policy, Paragraph 2.3.2.a. are met.

Some aspects of violations at power reactors cannot be addressed solely through the ARCOP. Additional information is found in NRC Enforcement Policy, Section 2.2.4, "Using Traditional Enforcement to Disposition Violations Identified at Power Reactors." In these cases, violations must be addressed separately from any associated ARCOP findings (when findings are present). Accordingly, these violations may be assigned severity levels ranging from SL IV to SL I based on increasing significance. SL I, II, and III NOVs are considered escalated enforcement actions.

Violations involving escalated enforcement, and potentially greater than green findings, must be reviewed by an enforcement panel or a significance and enforcement review panel (SERP), respectively. Enforcement panels are meetings to discuss and reach agreement on an enforcement approach for certain violations of NRC requirements. SERPs are meetings to discuss and reach agreement on the significance of inspection findings at power reactors and power reactors under construction that appear to be more significant than green under the SDP. An official agency preliminary significance determination of white, yellow, or greater-than-green can only be made by a SERP. When necessary, based on the results of a Regulatory Conference or written response provided by the licensee, the SERP provides the management review and a final decision regarding the finding's significance determination and enforcement action. The enforcement panel and SERP processes are described in detail in IMC 2571.

2. Dispositioning ARCOP Inspection Findings Associated with Non-licensees

The ARCOP uses administrative actions, such as NONs, to supplement the oversight program. An NON is a written notice to a vendor or certificate holder describing its failure to meet commitments related to NRC activities. These commitments are normally contained in contract requirements and are not directly imposed on the vendor or certificate holder by the NRC. In most circumstances, an NON does not include severity levels to represent the significance of the nonconformance. An NON is sent to the vendor or certificate holder as an attachment to an inspection report with a response expected which includes a description of the actions taken or planned to correct the nonconformance, the actions taken or planned to prevent recurrence, and the date when the corrective actions were or will be completed.

As mentioned earlier, it is expected that there will be offsite fabrication and assembly of reactor modules and/or nearly complete reactor plants by a project vendor under contract with a COL or CP holder. Project vendors are unlicensed entities. Therefore, inspection findings at an offsite advanced reactor project vendor facility will normally be dispositioned as NONs to the project vendor. Although NONs typically do not have a severity level or color assigned to them to represent significance, under ARCOP, the

SDP will be used to inform decision-making on inspection follow-up for inspection findings associated with project vendors. This process is only applicable to project vendors inspected under the ARCOP and is not used to screen traditional vendor findings, which will continue to be covered under the VIP.

c. Construction Assessment Program

The NRC assesses the effectiveness of project vendors, manufacturers, and licensees in assuring construction quality in accordance with IMC 2572, "Assessment of Advanced Reactor Construction Projects." In implementing the construction assessment program, the NRC staff integrates information relevant to project vendor, manufacturer, and construction quality, makes objective conclusions regarding the significance of inspection findings, takes actions based on these conclusions in a predictable manner, and effectively communicates these results to stakeholders. The types of ARCOP assessments and their relationship to performance monitoring and issue dispositioning are shown in Exhibit 3.

1. Continuous Assessment.

A lesson identified in the 10 CFR Part 52 Construction Lessons-Learned Report is that an annual assessment frequency is potentially too long for fast-paced projects such as advanced reactor fabrication, manufacturing, and construction, and a shorter assessment frequency is recommended. Additionally, a key difference between operating reactors and advanced reactors under construction is that operations are cyclical and conducive to a yearly assessment, while construction is linear and is more efficiently evaluated as inspection activities are completed. Therefore, the NRC will conduct ARCOP assessments continuously after the completion of each baseline inspection.

In implementing the continuous assessment for AR construction projects, the staff integrates information relevant to project vendor, manufacturer, and construction quality from the NRC's ACIP, the VIP, allegations, enforcement history, 10 CFR Part 21 and 10 CFR Part 50.55(e) reports, construction experience (ConE) and operational experience (OpE) reports, safety culture/safety conscious work environment (SCWE) insights, and other external sources as available to develop objective conclusions about the quality of different aspects of AR construction projects.

The continuous assessment is used to adjust BIP within the predetermined range of inspections to match the level of oversight needed to obtain reasonable assurance that the inspection area activities will continue to be conducted with adequate quality. Once minimum samples are completed in an inspection area, if the result of the continuous assessment is that reasonable assurance of quality has been demonstrated in the inspection area, then the baseline inspection plan is complete for that inspection area. When the baseline inspection plan is completed for all inspection areas, the baseline inspection program is complete for the respective AR unit.

If a reasonable assurance of inspection area quality determination has not been reached after the minimum number of samples are complete in an inspection area, then the cognizant branch chief may increase the inspection area baseline inspection samples beyond the minimum, not to exceed the maximum number of samples specified in the project-specific inspection planning matrix. Inspection samples beyond the maximum may be needed in rare circumstances. For example, if a CP or COL holder significantly changes their QAP or Engineering, Procurement, and Construction (EPC) contractor,

then additional inspection samples may be needed for continued assurance of quality. NRC divisional management's concurrence is required to increase sample inspections beyond the maximum specified in the project-specific inspection matrix.

The results of the continuous assessment will usually be included in the applicable inspection report in accordance with IMC 0618 and should discuss the basis for the reasonable assurance of quality determination for each inspection area inspected. Alternatively, an assessment letter may be issued to document assessment results.

2. ARCOP Finding Response Table

The staff determines the significance of construction inspection findings in accordance with the construction SDP described in IMC 2571. The construction SDP is a risk informed approach to significance determination that assigns a color of green, white, or yellow to inspection findings based on increasing risk significance. The color of inspection findings is the input to the FRT, which specifies the appropriate NRC response.

The NRC response to inspection results under the FRT will range from implementing the BIP when only very low significance issues are identified, to supplemental inspections for issues that have greater than very low significance. The FRT specifies the level of communication normally warranted for the identified findings. The assessment program will also consider whether suspension of construction activities is warranted due to unacceptable construction issues.

3. Overall Project Quality Assessment

When the baseline CIP is complete for a reactor construction project, the staff will conduct a final assessment of inspection results to inform the applicable licensing decisions. For reactor plants licensed under 10 CFR Part 50, the oversight program informs the decision to issue an operating license in accordance with 10 CFR 50.57. For reactor plants licensed under Part 52, the oversight program informs the 10 CFR 52.103(g) finding that the acceptance criteria in the combined license are met.

NRC staff will also evaluate the baseline inspection program for completed projects to determine if adjustments should be made to the design-specific inspection scoping matrix.

07.05 Resources

The resources required to implement the ARCOP will vary widely depending on the design complexity, risk, or other significant factors. As a minimum for each construction project, the APO will estimate the resources necessary to complete each ACIP activity for the construction project based on the minimum sample sizes required in the project-specific inspection scoping matrix and estimate the resources necessary to complete security and operational programs inspections and audits. Additional estimates will be necessary for reactive inspections and event response oversight. The total resource estimates for each ARCOP construction project will be reviewed and approved by NRC management.

The APO should continuously monitor the resources expended for each ARCOP construction project and assess their efficient use. Thresholds should be established so that, as they are approached, managers can investigate significant resource variations to determine the causes and take action to correct them.

07.06 Transition from ARCOP to ROP

After the Commission or designee makes a positive operational finding under 10 CFR 50.57 or 10 CFR 52.103(g), as applicable, regulatory oversight for the AR unit will transition to the ROP, and ROP cornerstones will be monitored. As such, the assessment requirements applicable to ARs under the ROP will then apply to that unit. The host region will inform the licensee of the transition to the ROP and of the NRC's planned level of inspection, assessment, and enforcement. The timing and format of this notification is flexible and can either be a stand-alone letter or be incorporated into the correspondence notifying the licensee of the OL issuance or 10 CFR 52.103(g) finding.

2570-08 REFERENCES

1. "10 CFR Part 52 Construction Lessons-Learned Report," dated January 16, 2024 (ML23325A202).
2. ADVANCE Act of 2024 (Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy Act of 2024), July 9, 2024.
3. Executive Order 14300, "Executive Order 14300—Ordering the Reform of the Nuclear Regulatory Commission, May 23, 2025.
4. IAEA SSR-2/1, revision 1, "Safety of Nuclear Power Plants: Design."
5. IMC 0102, "Oversight and Objectivity of Inspectors and Examiners at Reactor Facilities."
6. IMC 0301, "Coordination of NRC Visits to Commercial Reactor Sites."
7. IMC 0305, "Operating Reactor Assessment Program."
8. IMC 0609, "Significance Determination Process."
9. IMC 0618, "Advanced Power Reactor Construction Inspection Reports."
10. IMC 1007, "Interfacing Activities between Regional Offices of NRC and OSHA."
11. IMC 1245, "Qualification Program for Reactor Inspectors."
12. IMC 2203, "Security Inspection Program for Advanced Power Reactor Construction."
13. IMC 2501, "Inspection Activities Following Acceptance of a Docketed Application for a Permit, License, or NRC Authorization."
14. IMC 2507, "Vendor Inspections."
15. IMC 2515, "Light-Water Reactor Inspection Program-Operations Phase."
16. IMC 2571, "Dispositioning Advanced Power Reactor Construction Noncompliances."
17. IMC 2572, "Assessment of Advanced Reactor Construction Projects."

18. IMC 2573, "Inspection of The Advanced Power Reactor "Quality Of Reactor Plant Construction" Strategic Performance Area."
19. IMC 2574, "Inspection of The Advanced Power Reactor "Operational Readiness" Strategic Performance Area."
20. Inspection Procedure (IP) 35017, "Quality Assurance Implementation Inspection."
21. Management Directive 4.5, "Contingency Plan for Periods of Lapsed Appropriations."
22. Management Directive 8.8, "Management of Allegations."
23. NEI 08-01, revision 5, "Industry Guideline for the ITAAC Closure Process under 10 CFR Part 52," July 2013.
24. NEI 18-04, revision 1, "Risk-Informed Performance-Based Technology Inclusive Guidance for Non-Light Water Reactor Licensing Basis Development," August 2019.
25. NEIMA (Nuclear Energy Innovation and Modernization Act), January 14, 2019.
26. "Non-Light Water Reactor Near-Term Implementation Action Plans," July 12, 2017 (ML17165A069).
27. "NRC Non-Light Water Reactor Mid-Term and Long-Term Implementation Action Plans," July 12, 2017 (ML17164A173).
28. "NRC Vision and Strategy: Safely Achieving Effective and Efficient Non-Light Water Reactor Mission Readiness," December 2, 2016 (ML16356A670).
29. Office Instruction NRO-REG-103, "Inspections, Tests, Analyses, and Acceptance Criteria Closure Verification Process."
30. Office Instruction NRO-REG-105, "NRC Staff Support of the Inspections, Tests, Analyses, and Acceptance Criteria Hearing Process."
31. Policy Statement on the Regulation of Advanced Reactors (73 FR 60612; October 14, 2008).
32. SECY-25-00XX, "Update on Development of the U.S. Nuclear Regulatory Commission's Advanced Reactor Construction Oversight Program," dated XXXX XX, 202X (MLXXXXXXXXXX).
33. SECY-23-0048, "Vision for the Nuclear Regulatory Commission's Advanced Reactor Construction Oversight Program," dated June 6, 2023 (ML23061A086).
34. "STAFF REQUIREMENTS - SECY-98-144 - White Paper on Risk-Informed and Performance-Based Regulation," dated March 1, 1999 (ML003753593)

END

Exhibits:

1. Advanced Reactor Construction Oversight Program Regulatory Framework
2. Advanced Reactor Construction Oversight Program Overview
3. Advanced Reactor Construction Oversight Program Outline

Attachments:

1. History of NRC Reactor Construction Oversight
2. Acronyms
3. Revision History for IMC 2570

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Exhibit 1 – Advanced Reactor Construction Oversight Program Regulatory Framework

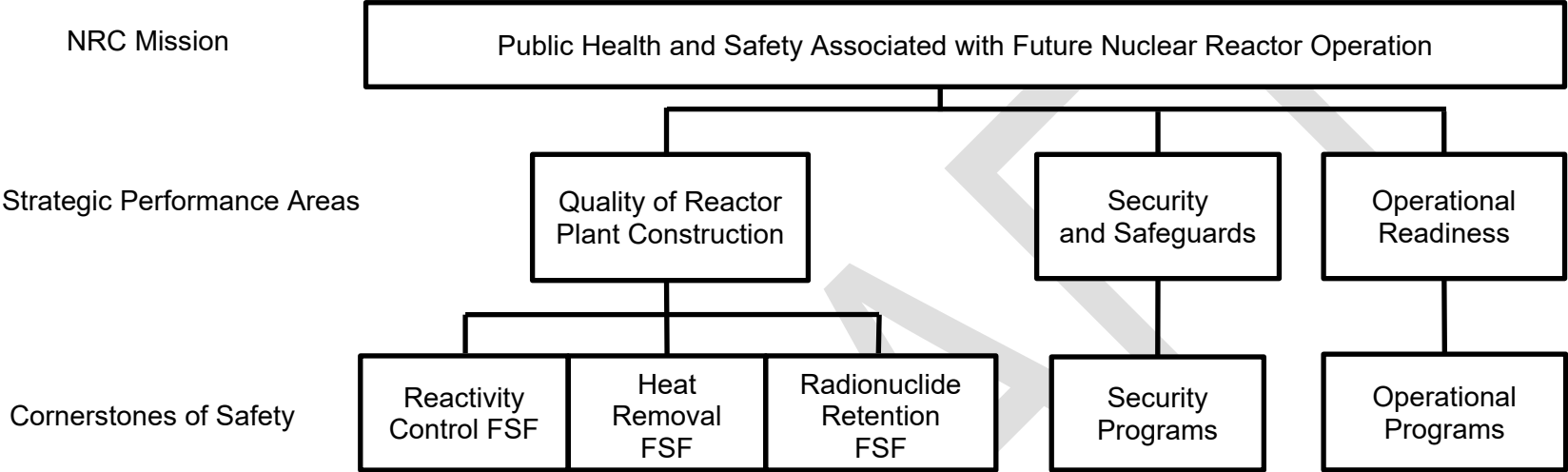


Exhibit 2 – Advanced Reactor Construction Oversight Program Overview

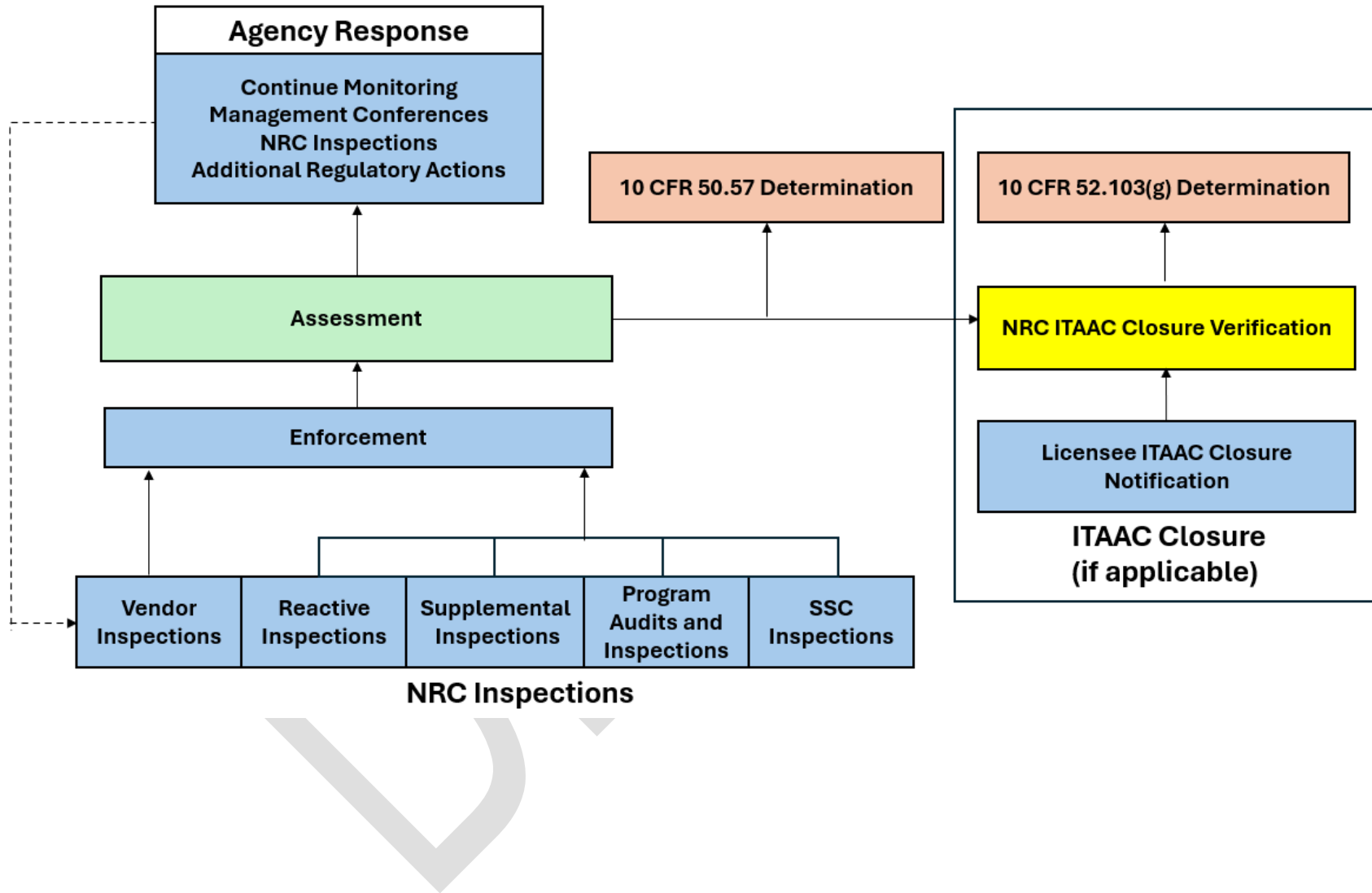
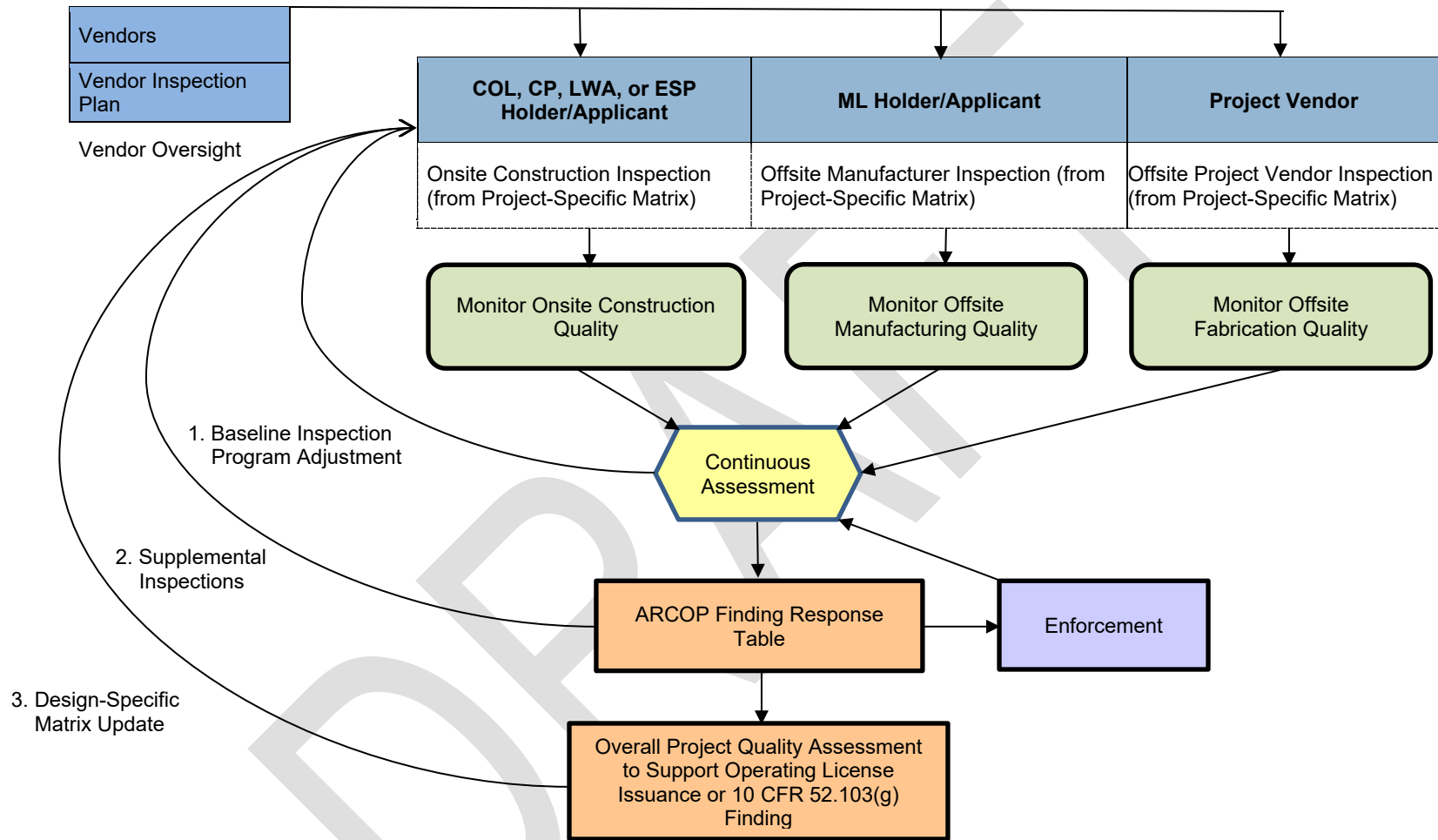


Exhibit 3 – Advanced Reactor Construction Oversight Program Outline



Attachment 1: Relevant History of NRC Reactor Construction Oversight

In the aftermath of the accident at Three Mile Island (TMI) in March 1979, the NRC suspended the granting of operating licenses for plants that were in the pipeline. The licensing pause for fuel loading and low-power testing ended in February 1980. In August 1980 the NRC issued the first full-power operating license since TMI, to North Anna, Unit 2, in Virginia. In the following 9 years it granted full-power licenses to over forty other reactors, most of which had received construction permits in the mid-1970s.

The lengthy and laborious licensing procedures that applicants had to undergo in the cases of Shoreham, Seabrook, and other reactors stirred new interest in simplifying and streamlining the regulatory process. Specifically, obtaining an operating license after construction was complete (two-step process) increased the risk and complexity of the licensing process. This risk and complexity were a major deterrent to utilities who considered building nuclear plants.

The NRC proposed to simplify the traditional two-step licensing process with a one-step process. After much deliberation, the Commissioners, staff, and nuclear vendors, converged on the one-step licensing process (10 CFR Part 52) that was authorized in 1989.

The NRC issued NUREG-1055, "Improving Quality and the Assurance of Quality in the Design and Construction of Nuclear Power Plants: A Report to Congress," in May 1984. The NUREG detailed lessons learned during the early days of construction under 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities." This report concluded that the U.S. Nuclear Regulatory Commission (NRC) was slow to detect and take strong action on significant quality problems that developed during nuclear power plant construction projects. In addition, the NRC did not have a formal assessment process in place to evaluate the performance of construction permit holders.

Following the accident at TMI, the NRC initiated an effort to better address licensee performance through the Systematic Assessment of Licensee Performance (SALP) program. Under the SALP program, the NRC periodically reviewed the overall performance of each nuclear power plant licensee (both construction permit holders and operating license holders) in a number of different functional areas. Each functional area evaluated was assigned to one of three categories to indicate whether more, less, or about the same level of NRC inspection and licensee attention was appropriate for the coming period. The NRC intended the SALP assessment to be sufficiently diagnostic to provide a rational basis for assessing licensee performance, allocating NRC inspection resources, and providing meaningful guidance to licensee management.

In 1991, the NRC began work to revise the construction inspection program (CIP). This project had two purposes: 1) to address programmatic weaknesses that had been identified during the inspection and licensing of plants in the 1980s, and 2) to develop an inspection program for evolutionary and advanced reactors. The NRC suspended the project in late 1994, because of the lack of nuclear power plant construction activities. In October 1996, the NRC issued "Draft report on the Revised Construction Inspection Program," which presented a framework from which the CIP could be reactivated to support NRC inspections at future nuclear power plants. This framework included recommendations for continuous NRC onsite inspection presence that matches inspector expertise to inspection needs, an inspection procedure format that clearly defines the attributes and associated acceptance criteria that must be inspected, and a dedicated CIP information management system (CIPIMS) to be used to implement the CIP in concert with the inspection manual.

Late in 2000, the industry renewed interest in constructing new nuclear power plants. On February 13, 2001, the Commission issued a staff requirements memorandum (SRM) for COMJSM-00-0003, directing the staff to assess its technical, licensing, and inspection capabilities and identify enhancements, if any, that would be necessary to ensure that the agency can effectively carry out its responsibilities associated with an early site permit (ESP) application, a license application, and the construction of a new nuclear power plant.

The staff first responded to this SRM in a memorandum dated May 1, 2001. This memo outlined several organizational changes, including the temporary establishment of the Future Licensing Organization in NRR, which was responsible for coordinating the preparations for the review of new applications (i.e., ESPs, design certifications, and combined licenses). This memo also informed the Commission that NRR would reactivate the CIP revision effort suspended in 1994, and that this effort would include review and revisions of applicable IMCs and development of the associated inspection guidance and training for inspection of critical attributes of construction processes and activities.

On October 12, 2001, the staff further responded to COMJSM-00-0003 by submitting SECY-01-0188, "Future Licensing and Inspection Readiness Assessment." This SECY paper included the "Future Licensing and Inspection Readiness Assessment Report," summarizing the efforts of an interoffice working group. This report included resource estimates for revising IMCs 2511, 2512, 2513, and 2514; indicated that the NRR Inspection Program Branch (IPB) would lead CIP revisions; and discussed the formation of the New Reactor Licensing Project Office in NRR. IPB formed the CIP team, composed of representatives from each region, new reactor licensing staff, and inspection program management, and tasked it with updating the inspection and assessment program for use in inspecting reactors to be licensed and constructed under 10 CFR Part 52. NUREG 1789, "10 CFR Part 52 Construction Inspection Program Framework Documents," which was issued in April 2004, describes the work of this team.

The CIP developed by this team had four phases. The first and second phases supported a licensing decision for an ESP and the COL application. Inspections were initially performed to confirm the accuracy of data submitted to the NRC in support of safety evaluations for an ESP and COL. The third and fourth phases supported construction activities and the preparations for operation. Prior to and during plant construction, the NRC conducted off-site inspections to review vendor activities and licensee oversight of these activities. During plant construction, on-site inspections focused on verifying satisfactory completion of ITAAC, as specified in the FSAR, and on inspecting programs for operational readiness and transition to power operations.

The Construction Reactor Oversight Process (cROP) was developed to implement the CIP at Summer Units 2 and 3 prior to the suspension of construction and at Vogtle Units 3 and 4 through the 10 CFR 52.103(g) decision for Units 3 and 4. The cROP is described in detail in IMC 2506, "Construction Reactor Oversight Process General Guidance and Basis Document."

Since cROP development and implementation, new reactor construction interest has grown to include large LWRs, SMRs and microreactors using both LWR and non-LWR technology. While the cROP provided effective oversight for the construction of large LWRs under a COL, given the expected diversity of advanced reactor projects and deployment models, the staff communicated its intent to take a fresh look at construction oversight through development of the ARCOP to the Commission in SECY-23-0048, "Vision for the Nuclear Regulatory Commission's Advanced Reactor Construction Oversight Program," dated June 6, 2023 (ML23061A086).

The staff established an Advanced Reactor Construction Advisory Committee (ARCAC) of Nuclear Regulatory Commission (NRC) leadership to assist the staff in developing and communicating the ARCOP. Under the direction of the ARCAC, the staff applied the guiding principles discussed in SECY-23-0048 and cROP lessons learned to develop the ARCOP regulatory framework and the ARCOP elements of inspection, dispositioning issues, and assessment. The development and implementation of the ARCOP has superseded the cROP which will no longer be implemented for reactor construction oversight.

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Attachment 2 - Acronyms

AARM	Agency Action Review Meeting
ACIP	ARCOP Construction Inspection Program
ADAMS	Agency-wide Documents Access and Management System
ADVANCE Act	Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy Act of 2024
AIMS	ARCOP Information Management System
APO	ARCOP Program Organization
AR	Advanced Reactor
ARCAC	Advanced Reactor Construction Advisory Committee
ARCOP	Advanced Reactor Construction Oversight Program
AV	Apparent Violation
BIP	Baseline Inspection Program
CAL	Confirmatory Action Letter
CAP	Corrective Action Program
CFR	Code of Federal Regulations
COL	Combined License
ConE	Construction Experience
CP	Construction Permit
cROP	Construction Reactor Oversight Process
DANU	Division of Advanced Reactors and Non-Power Production and Utilization Facilities
DFI	Demand for Information
DORS	Division of Operating Reactor Safety
EP	Emergency Preparedness
ESP	Early Site Permit
FR	Federal Register
FRT	ARCOP Finding Response Table
FSF	Fundamental Safety Functions
ICN	ITAAC Closure Notification
IMC	Inspection Manual Chapter
IP	Inspection Procedure
ITAAC	Inspections, Tests, Analyses, and Acceptance Criteria
LWA	Limited Work Authorization
LWR	Light Water Reactor
MD	Management Directive
ML	Manufacturing License
NCV	Non-cited Violation
NEI	Nuclear Energy Institute
NEIMA	Nuclear Energy Innovation and Modernization Act
NOD	Notice of Deviation
NON	Notice of Nonconformance
NOV	Notice of Violation
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
OL	Operating License
QAP	Quality Assurance Program
ROP	Reactor Oversight Process

SC	Safety Culture
SCN	Self-Identified Construction Noncompliance
SCWE	Safety Conscious Work Environment
SDP	Significance Determination Process
SERP	Significance and Enforcement Review Panel
SL	Severity Level
SMR	Small Modular Reactor
SSCs	Systems, Structures, and Components
SUNSI	Sensitive Unclassified Non-Safeguards Information
TE	Traditional Enforcement
UARP	Advanced Reactor Policy Branch
URI	Unresolved Item
VIO	Violation
VIP	Vendor Inspection Program

Attachment 3 – Revision History for IMC 2570

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional, Non-Public Information)
N/A	ML25210A571 XX/XX/2X CN XX-XXX	This is a draft version of this IMC. It is part of a set of IMCs that will implement the future Advanced Reactor Construction Oversight Program (ARCOP). This draft IMC will be the topic of discussion at a public workshop on August 26, 2025.	TBD	ML XXXXXXXXX