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REGULATORY ENGAGEMENT PLAN

Revision 1

TABLE OF CONTENTS

1 - INTRODUCTION

Deep Fission, Inc., (hereafter "Deep Fission") was incorporated as a Delaware C-Corp in July 2023 and was founded by Dr. Richard Muller, who serves as CTO, and by Elizabeth Muller, who serves as CEO. Deep Fission expects to confirm a customer and its first site in the first quarter of 2025. Therefore, Deep Fission now intends to submit a Combined Operating License Application (COLA) under 10 CFR, Part 52, Subpart C, rather than a Standard Design Approval Application (SDAA) as previously discussed with the Nuclear Regulatory Commission (NRC) for its pressurized light water reactor in the Fall of 2026.

The primary purpose of this Regulatory Engagement Plan (REP) is to establish open communications and enhance collaboration with the NRC to reduce complexity during the pre-application, application, and post-application regulatory processes.

Deep Fission's first pre-application engagement with the NRC was an introductory meeting on February 29th, 2024, followed by Deep Fission's submission of its "Deep Fission Response to NRC Regulatory Issue Summary 2020-02" [Reference 1] on March 12th, 2024. Going forward, Deep Fission intends to use a staged and adaptive approach with the NRC that will include submission and review of white papers and topical reports to address safety-related issues that arise during the engagement with the NRC throughout the company's nuclear development life cycle.

The following introduction section provides points of contact for correspondence, a background on Deep Fission's company structure, an overview of the REP objectives, a high-level background on the project, and Deep Fission's regulatory approach summary.

1.1 - CONTACT INFORMATION

Please refer to the following points of contact for all correspondence with Deep Fission:

- Elizabeth Muller, Chief Executive Officer (CEO)
  Email: liz.muller@deepfission.com
- Dr. Richard Muller, Chief Technical Officer (CTO)
  Email: rich.muller@deepfission.com

- Malcolm Thompson, Chief Operating Officer (COO)
  Email: malcolm.thompson@deepfission.com
- Mark Peres, Vice President of Engineering
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- Ingrid Nordby, Senior Licensing Engineer
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Deep Fission will accommodate the NRC's preferred method of communication for official interactions but prefers to communicate via email. Please send all mail correspondence to Deep Fission corporate headquarters mailing address:

Deep Fission, Inc.
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1.2 - COMPANY STRUCTURE

Deep Fission was incorporated as a Delaware C-Corp in July 2023 and is neither affiliated with, nor a subsidiary of, any other company. Its founders, Elizabeth Muller (CEO) and Dr. Richard Muller (CTO), have significant experience in regulatory engagement related to nuclear waste management and disposal through previously co-founding and managing Deep Isolation, a nuclear waste disposal and storage company, which was incorporated in 2018. Deep Fission has no foreign ownership nor control issues and actively reviews its business and financial activities to ensure the company is not in violation of any export control restrictions, or any other restrictions originating from agencies separate and apart from the NRC to the best of its ability. The founders and Deep Fission are committed to a respectful and effective relationship with the NRC during all engagement phases of the licensing process, including its Quality Assurance (QA) program for design development.

Deep Fission is financially qualified and sufficiently solvent to carry out pre-application engagement activities and will provide all required fee payments upon request from the NRC. While contracts

with the Departments of Energy and Defense may be possible in the future, Deep Fission currently expects to govern this project solely under the NRC's regulatory authority and guidance.

1.3 - STRATEGIC APPROACH

Procedural Strategy

The prospective submission date for the COLA is Fall of 2026 based on an internally developed timeline and project management plan that is updated regularly. The COLA submission will include a Final Safety Analysis Review (FSAR) and Environmental Report. Deep Fission intends to engage an environmental report vendor in the first quarter of 2025.

Substantive Strategy

The COLA will need to consider the nontraditional emplacement of the Deep Fission pressurized light water reactor. A major benefit of the reactor's emplacement in a deep borehole is the billion tons of surrounding bedrock above and around it, which provides safe and natural functional containment. The use of natural functional containment will be unique to the company's reactor design and will need to be reviewed in future white papers and topical report submissions. Compliance with NRC regulations concerning monitoring and visual inspection may be challenging due to the deep borehole emplacement of the Deep Fission reactor. Therefore, coordination and guidance from the NRC on remotely operated nuclear reactor designs will be an early matter of discussion. Other exemptions may include the use of passive safety systems, microreactor emergency planning zone reduction, and reduced operational staffing requirements due to the microreactor size. Each of these exemptions will be considered in close coordination with the NRC.

Deep Fission will demonstrate in forthcoming topical reports and white papers, with appropriate data to support its conclusions, that this natural functional containment sufficiently replaces the traditional surface containment structures present in above-ground nuclear plants to ensure the public's health and safety.

The suitability of a site will be assessed before any reactor is installed through a feasibility study, which will include gathering isotopic measurements. This approach evaluates the historical movement of natural radioisotopes at specific depths, a method commonly employed by geologists to date deep water. If an analysis of the isotopic geology for a specific site indicates, for example, that the vertical migration rate could pose safety risks to the public based on NRC regulations, the site will be deemed unsuitable for reactor installation. Other criteria will also be evaluated and presented to the NRC as appropriate.

Deep Fission does not anticipate requesting any significant changes to NRC policy to complete the proposed licensing strategy and pathway. At this time Deep Fission is not considering applying for an Early Site Permit, Design Certification, or Limited Work Authority.

1.4 - BACKGROUND

The Deep Fission reactor design is based on widely understood and accepted pressurized water reactors (PWRs), which the NRC has approved and are operational today. This REP follows similar regulatory and technical approaches taken by PWR, small modular reactor, and microreactor industry peers based on comparable designs and regulatory approaches. Deep Fission recognizes novel safety-related concerns may arise due to the reactor's emplacement in a one-mile-deep borehole. Accordingly, Deep Fission will utilize internal and external incorporation by reference of standard PWR systems to allow in-depth analysis and discussion with NRC staff on the regulatory requirements being met in nontraditional means. The impetus to design a reactor that can be placed underground is Deep Fission's desire to provide uncompromising safety and cost-effective production of carbon free nuclear electricity. Using natural functional containment and pressurization at depth may eliminate the need for costly concrete and steel surface containment buildings, thereby enabling a Deep Fission reactor to produce electricity at a cost similar to coal power production, while maintaining incomparable safety.

1.5 – REGULATORY ENGAGEMENT APPROACH

This REP follows the format authored by the Nuclear Energy Institute's (NEI) 18-06, "Guidelines for Development of a Regulatory Engagement Plan" [Reference 2]. The current schedule for submissions to the NRC, including white papers, conceptual design reviews, and topical reports are included in Appendix A.

Deep Fission will submit the COLA in the Fall of 2026. An official update to this REP will be provided approximately every six months, and all updates will be communicated to the NRC staff through emails and regularly scheduled meetings until COLA submission in Fall of 2026. Deep Fission will update this REP during this process, incorporating NRC recommendations and guidance.

2 - TECHNOLOGY SUMMARY

The Deep Fission Borehole Reactor 1 (DFBR-1) is a pressurized light water microreactor producing 45 MWt (thermal), 15 MWe (electric), designed to use deep geology to provide safety and security and to lower the cost of nuclear power by using the deep geology to provide pressurization and functional containment. DFBR-1 will use standard low enriched uranium (LEU) fuel identical to that used in current PWRs.

The reactor core will be cooled by light water in a primary modular loop, with circulation driven by natural convection. Above the reactor core, but still deeply buried, a heat exchanger will boil water in a secondary loop, and the steam will be brought to the surface through a steam pipe. The secondary loop water flow may be driven by a pump operating at the surface. As in other PWRs, the light water in the primary loop provides both cooling and neutron moderation. Except for its unique configuration (a narrow reactor in a deep borehole), the design of the reactor is fundamentally similar to that of traditional, surface a PWR.

The nominal borehole is vertical or near vertical as seen in Figure 1 below.

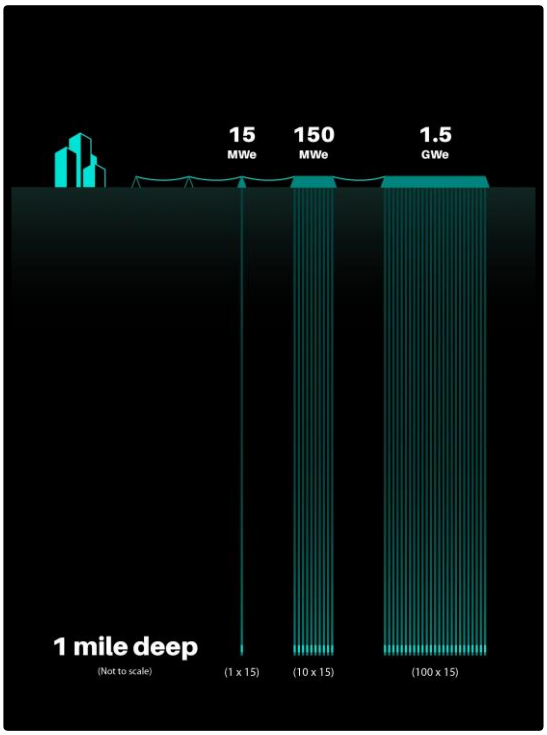

Figure 1: Examples of Power Production Options

The reactor will be emplaced up to 1 mile (1.6 km) deep at sites that will have been reviewed for safety and environmental concerns. The DFBR-1 will not be placed at a location with deep fresh-water aquifers nearby. Safety is also being inherently addressed in the design of the reactor itself. Hydrostatic pressure at that depth is 160 atmospheres, similar to the pressure found in traditional PWRs. By utilizing this similarity, DFBR-1 will not require thick-walled pressurization vessels. Functional containment is provided by 10 billion tons of natural shielding surrounding the reactor. Deep Fission does not expect significant risk of radioactive danger to the public or contamination of shallow aquifers in the surrounding area. Similarly, the reactor is isolated from beyond design basis events that threaten surface reactors, such as tornadoes, tsunamis, airplane crashes, fires, and human intrusion.

The minimum diameter of DFBR-1 is expected to be approximately 30 inches. The height of the nuclear core is approximately 4 meters. Reactivity control may be managed through remotely operated control rods and by a natural negative reactivity coefficient. In-situ sensors provide operation-relevant information to the surface-level control room. The only moving parts are the control rods, possible valves for boric acid addition and removal, and the flow of cooling water. In an emergency trip, the control rods are driven by gravity.

The design is passively safe and intrinsically accident resistant. A loss of coolant accident (LOCA) cannot occur from a leak in a pipe since the reactor is not surrounded by air but is immersed in high pressure water. A steam bubble from a LOCA is buoyant and will rise and will be replaced by the emergency core cooling system (ECCS) provided by the water in the casing. The mile of water above the reactor provides a natural ECCS if a LOCA-induced steam bubble develops. In the event of such an accident, any radioactivity released would occur a mile underground and dissipate well before reaching the surface or any cut after surface established by the NRC.

The reactor is designed to be retrieved at the end of the fuel cycle using cables that are permanently attached to the reactor. A new reactor will be placed in the same borehole at a slightly shallower depth or in a new borehole nearby. Alternatively, there is the option, if regulations permit in the future, for the hole to be plugged when the fuel is spent. The nuclear waste can then be disposed of in place. GfK, a German market-research group, completed a national survey in the US in 2018, which confirmed the American public prefers deep local disposal rather than above-ground transport of radioactive materials over local roads [Reference 3].

3 - REGULATORY STRATEGY

Deep Fission describes its regulatory approach in the following section, beginning with the specific application type to be prepared during the pre-application engagement with the NRC. There will be multiple opportunities for Deep Fission's regulatory strategy to change through a staged and adaptive approach as new information becomes available.

Applicable regulations and guidance documents will be cited and incorporated by reference to provide a basis for the decisions and processes to be followed throughout the regulatory strategy section of this report. An assessment of the gaps in applicable regulations will be performed in the near future. This section also includes a short review of the DFBR-1 preliminary principal design criteria selection process.

3.1 - APPLICATION TYPE

Deep Fission expects to submit its COLA under 10 CFR Part 52 by Fall of 2026. The COLA authorizes the licensee to construct and operate a nuclear power plant at a specific site. Deep Fission expects to select a site in 2025.

3.1.1 - Combined License (10 CFR 52 Subpart C)

The COLA will address the requirements in 10 CFR 52, Subpart C. Sections 52.77, 52.79, and 52.80 will be referenced extensively. The FSAR will be completed with a site-specific Emergency Plan inclusive of all required inspections, tests, analyses, and acceptance criteria (ITAAC). The site-specific Environmental Report may be drafted with the assistance of third-party vendors, who will provide environmental and engineering consultancy services, following the requirements provided in Section 51.55.

3.1.2 - Other Considerations

Deep Fission's assessment of NEI Guidelines suggests that there are a variety of recommendations that are not currently applicable to Deep Fission's pre-application engagement with the NRC. For example, since Deep Fission's work to-date is limited in scope to domestic activities, reference to international requirements in the NEI Guidelines is considered inapplicable to Deep Fission's NRC applications.

3.1.3 - Staged and Adaptive

Deep Fission will use a staged and adaptive approach in its COLA to allow for real-time corrections, modifications, and revisions of its design to ensure safety-related elements adhere to NRC regulatory requirements.

Deep Fission has completed a conceptual design review as recommended in the draft "NRC Vision and Strategy: Safely Achieving Effective and Efficient Non-Light Water Reactor Mission Readiness."

The review has identified key design issues that Deep Fission will need to address at early stages of the design and licensing process in conversation with the NRC giving both parties a more efficient way to review and modify the design within the appropriate regulatory framework.

3.2 - NATIONAL ENVIRONMENTAL POLICY ACT

Per the National Environmental Policy Act (NEPA), the NRC requires COLA applicants to submit an Environmental Report based on a site-specific study. As stated above, the Environmental Report will be included in the COLA.

3.3 - GENERAL AND PRINCIPAL DESIGN CRITERIA

The General Design Criteria (GDC) and Principal Design Criteria (PDC) are both established by the NRC to ensure the safety and reliability of nuclear power plants, but they serve different purposes. GDCs baseline safety standards apply to all nuclear power plants, while PDCs are specific to a particular nuclear power plant design and are tailored to address the unique aspects and safety considerations of that design.

3.3.1 - 10 CFR 50 Appendix A, General Design Criteria (GDC)

Deep Fission intends to satisfy GDC requirements during the development of its nuclear design process by incorporating those requirements into its design. Some key steps include:

1. Understanding GDC Requirements: Reviewing the GDC outlined in Appendix A to 10 CFR Part 50 to understand the minimum requirements for the design of nuclear power plants.

2. Design Bases: Establishing design bases that address protection against natural phenomena, fire protection, environmental and dynamic effects, and sharing of structures, systems, and components.
3. Multiple Fission Product Barriers: Ensuring the design includes multiple barriers to protect against the release of radioactive materials.
4. Protection and Reactivity Control Systems: Implementing reliable protection and reactivity control systems to manage reactor power oscillations and ensure safety during anticipated operational occurrences.
5. Fluid Systems: Designing high-quality reactor coolant boundaries, fracture prevention measures, and emergency core cooling systems.
6. Reactor Containment: Ensuring the functional containment design meets criteria for preventing leakage, testing, and inspection.
7. Fuel and Radioactivity Control: Implementing measures to control the release of radioactive materials and prevent criticality in fuel storage and handling.
8. Compliance and Documentation: Documenting compliance with GDC and providing detailed design information in the application.

3.3.2 Establishment of Principal Design Criteria

Deep Fission's PDCs will primarily be based on 10 CFR Part 50 Appendix A, and design criteria of advanced reactors will be considered. Design-specific PDCs will be proposed due to the unique emplacement of the DFBR-1 in a deep borehole.

PDCs will be discussed with the NRC when identified in Deep Fission's development of reactor structures, systems, and components (SSCs) to ensure the underlying safety-related intent behind each NRC regulation is being satisfied. PDCs will also be listed in the company's application as required under 10 CFR 52.137.

3.4 - SELECTION OF APPLICABLE GUIDANCE

In order to create a consistent and standardized REP drafting process, Deep Fission reviewed and applied guidance from a series of documents, including:

a) "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition" (NUREG-0800);

b) "Light-Water Small Modular Reactor Edition" (NUREG-0800, Introduction Part 2);

c) Regulatory Guide (RG) 1.206, Application for Nuclear Power Plants; and

d) NEI Guidelines.

These documents provide detailed information on pre-application phase activities with the NRC and application formatting suggestions. Additional reference materials will be incorporated as they become available:

- NUREG-1555, RG 4.2, and RG 4.7 will be referenced when a site has been confirmed.
- NUREG-1537 and RG 2.5 will not be referenced since they are only applicable to non-power, test, or research reactors.

3.4.1 - NUREG-0800

Deep Fission is using NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition" as guidance in drafting its application to increase regulatory transparency and advance conversations between NRC staff reviewing Deep Fission's application.

Application drafting will also be supplemented by integrating the NRC's Standard Review Plan (NUREG-0800) for nuclear power plants into the company's NRC licensing application. The Standard Review Plan (SRP) is a tool used by the NRC staff to guide the review process, which can lead to faster review times and a more efficient licensing process, but it is not a substitute for compliance with NRC regulations. An NRC assessment of the application against NUREG-0800 will be needed prior to docketing of the application. Any exemption requests from regulations based on

inapplicability to specific requirements in NUREG-0800 or proposed changes in acceptance criteria will be raised with NRC staff as early as possible.

3.4.2 - NUREG-0933

Along with the guidance documents provided by the NRC and NEI, Deep Fission will also review the Generic Issues Program for issue status and resolution of generic safety issues through NUREG-0933 and the online Generic Issue Management Control System. Proposed solutions to unresolved medium and high-priority generic issues will be provided at the time of the submission of the COLA, though attention will be given to all unresolved issues throughout the application process as well.

3.4.3 - Regulatory Guide 1.206

Deep Fission will be preparing its application based on the guidance in RG 1.206, “Combined License Applications for Nuclear Power Plants”. By applying NUREG-0800 and RG 1.206, Deep Fission will be able to standardize the preparation of the application in the hopes of an efficient review process. Any content that has yet to be fully transitioned from RG 1.70 to NUREG-0800 will be included in the review process.

3.5 - USE OF STANDARDS AND INDUSTRY GUIDANCE

The effective utilization of consensus standards and industry guidance are central to Deep Fission’s pre-application engagement activities. As highlighted in this REP, consensus standards from professional engineering societies will guide Deep Fission ’s technical development.

3.5.1 - Consensus Standards

Deep Fission refers to the consensus standards approved by professional standards development organizations of relevance including the American Nuclear Society (ANS), the American Society of Mechanical Engineers (ASME), and others accredited by the American National Standards Institute (ANSI). These consensus standards will be referenced extensively in the COLA. Deep Fission will

meet with NRC staff to discuss the relevant consensus standards as well as the industry guidance documentation from NEI and Electrical Power Research Institute (EPRI).

3.5.2 - Nuclear Energy Institute (NEI) Guidance

The NEI Guidelines are widely recognized across the nuclear energy industry as the leading guide for drafting quality REPs and properly collaborating with the NRC during the pre-application phase. This guide has been extensively referenced in past REPs by many of Deep Fission's industry peers. Deep Fission will also continue to review guidance documents from NEI on a variety of technical and policy issues.

3.5.3 - Electric Power Research Institute (EPRI) Guidance

In addition to extensively referencing the NEI's guidance on a range of industry relevant issues, Deep Fission will coordinate its research and development with the EPRI and resources, such as the EPRI's "Advanced Nuclear Technology: Advanced Light Water Reactor Utility Requirements Document, Revision 13" [Reference 4]. Topical areas such as the Pressurized Water Reactor Materials Reliability Program, Pressurized Water Reactor Steam Generator Management Program, and Advanced Nuclear Technology Program are all relevant to Deep Fission. Consistent communication and collaboration with EPRI will allow for standardization in the design and engineering of the pre-application phase.

3.6 - ASSESSING ALIGNMENTS AND GAPS

An assessment of regulatory gaps will be provided in a white paper to the NRC referencing regulatory gap reports from other companies to illustrate best practices and the current accepted industry standards. Deep Fission's regulatory gap analysis will occur within the first eighteen months of the pre-application phase. Deep Fission recognizes this analysis is not required but expects that this gap analysis will minimize future regulatory risk.

3.6.1 - Principal Design Criteria

10 CFR Part 50, Appendix A, establishes GDCs that are considered the "minimum requirements for principal design criteria (PDC) for water-cooled nuclear power plants similar in design and location to plants for which construction permits have been issued by the Commission." RG 1.232 also provides guidance on the creation of PDCs for non-light water reactors which may be relevant to Deep Fission's design and unique emplacement. While most GDCs will be applicable, Deep Fission will engage with NRC to address those that do not to identify potential variances from GDC within the first twelve months of the pre-application phase.

3.6.2 - Design Specific Review Standard and Risk-Informed Review

While a large majority of the review criteria applied to the Deep Fission reactor are easily reviewed using NUREG-0800, a few Design-Specific Review Standards (DSRS) are currently under consideration by Deep Fission. DSRS provide detailed, design-specific guidance that complements the broader SRPs, both of which are used to ensure that nuclear facilities meet NRC regulations.

Similar to the NuScale Power DSRS, Deep Fission may augment its SRP analysis with DSRS. The use of risk-informed, performance-based review standards, as applied to advanced reactors, may also be another pathway for Deep Fission to make minor changes to the review standards applied due to the reactor's emplacement deep underground in a borehole. This topic of exemptions to the SRP and DSRS use will be raised with the NRC staff within the first twelve months of engagement.

3.6.3 - Ad Hoc Assessments

Along with the traditional assessments of principal design criteria and design specific review standards, Deep Fission has also reviewed alternative guidance from the Regulatory Framework Documents by the Tennessee Valley Authority, the Regulatory Gap Analyses by NuScale Power, and the assessments of the Next Generation Nuclear Plant. By using as much of the light-water reactor regulatory guidance as possible, Deep Fission intends to produce a brief regulatory gap analysis white paper on the potential exemptions already approved by other license applicants as well as those specific to the Deep Fission reactor design.

3.7 - DESIGN-CENTERED REVIEW APPROACH

Deep Fission will be applying a design-centered approach to licensing with the NRC, also known as the Design-Centered Review Approach (DCRA), focusing on standardizing the review process for nuclear reactor designs to enhance efficiency and predictability. The initial COLA will serve as a "reference" COLA (R-COLA) for each "subsequent" COLA (S-COLA) containing identical content but excluding site-specific information. The S-COLA submission will include design information in a Design Control Document (DCD) based on RG 1.206. Deep Fission is not yet participating in a Design-Centered Work Group but will consider creating one in the future in coordination with NRC staff on any generic reference topics of interest.

3.8 - KEY ISSUES

Deep Fission will be in regular communication with the NRC on all key issues raised by NRC staff as well as any specific issues related to the emplacement of a nuclear reactor in a borehole. Early identification of issues will allow resolution in the design and development phases of the Deep Fission reactor. The submission of white papers will be the standard mechanism to initiate discussion between Deep Fission and the NRC to address key issues and memorialize all resolutions in the final COLA.

3.8.1 - Generic Issues

Deep Fission is tracking and reviewing the Generic Issues Program of the NRC. Potential reference of generic issues under screening and implementation may be included in the final COLA. Deep Fission will continue to review the Generic Issues Program dashboard, as well as the periodic updates to NUREG-0933. If NRC staff associate insights as generically applicable, Deep Fission will also collaborate on those items with technical relevance to other pressurized light water reactors.

3.8.2 - New Reactor Issues

Deep Fission regularly reviews the NRC Resolved Policy Issues list on the NRC website for relevant actions Deep Fission can adopt in its COLA. The Resolved Policy Issues list refers to technical and

policy issues that the NRC has addressed and resolved over time. The resolution of these issues may involve new or revised rules, guidance, or interpretations that affect nuclear power plant licensees and other entities under NRC jurisdiction. Deep Fission will also coordinate with industry groups, such as the NEI, the Nuclear Innovation Alliance, and the Nuclear Industry Council, along with selected working groups available within these organizations.

3.8.3 - Selected Specific Issues

The following specific issues will be addressed by white papers or in-person meetings with the NRC. Additional issues will be added to this REP as they arise as Deep Fission transitions from conceptual design to engineering design in the upcoming year.

3.8.3.1 Reactor Staffing

Deep Fission will expect to reduce reactor staffing in subsequent iterations of the reactor design based on recent microreactor exemption requests. A combined white paper on this topic and other topics of similar microreactor exemption likelihood is expected. Deep Fission will also incorporate by reference any potential reductions in control room staffing while meeting all applicable regulations.

3.8.3.2 Safeguards and Security

Deep Fission will submit a comprehensive white paper on safeguards and security, covering crucial safety-related issues such as design considerations for physical security, the use of detection and assessment, and security staffing requirements. The white paper will also include the Safeguards Information Plan (SIP). This engagement aims to review and refine the Deep Fission's SIP for safeguards information (SGI) and the protection of the reactor. Upon successful review and approval by the NRC, this plan will enable Deep Fission to access vital SGI data necessary for integrating safeguards and security measures of the facility design and physical security program. The deep borehole emplacement will serve as a significant protection and safeguard for the reactor.

3.8.3.3 Emergency Planning

Deep Fission will apply the final rule and associated regulatory guide using risk-informed, performance-based emergency preparedness requirements to small modular reactors and microreactors. The new emergency planning framework will be followed to demonstrate effective responses in drills and exercises for emergencies and accidents. Deep Fission will provide a hazard analysis for adjacent facilities, ensuring they do not impede emergency plans. The emergency planning zone size, which will likely be very small due to the microreactor size, is expected to be scalable based on the guidance provided by the NRC. Additionally, Deep Fission emergency plans will detail ingestion response planning, outlining offsite resources to prevent contaminated food and water from entering the ingestion pathway.

3.8.3.4 Fuel Qualification

Deep Fission's paper on fuel qualification will be consistent with traditional and well-understood fuel practices currently in use at multiple commercial nuclear power plants across the United States. Deep Fission intends to use publicly available data from existing fuel tests to validate its fuel capabilities as part of the company's fuel qualification program development efforts. This will help Deep Fission confidently validate assumed failure rates in both regular operation and accident scenarios for the reactor. As the design of Deep Fission's reactor evolves, along with alterations in service conditions and performance criteria, changes may be needed in order to make the fuel irradiation and testing programs align with these changes. Deep Fission's approach to fuel qualification will be finalized in coordination with fuel vendors and will include the use of data from LEU ceramic fuel used in PWRs.

3.8.3.5 Seismic

Deep Fission will submit a comprehensive white paper focusing on seismic safety, delving into critical aspects such as anticipated challenges, and including site seismicity and evolving seismic characterizations. Additionally, this white paper will discuss the importance of considering seismic isolators in the design process and addressing beyond-design-basis considerations, which are extremely relevant with the deep borehole emplacement.

3.8.3.6 Flooding

Flood safety-related issues will be addressed in a comprehensive white paper to address anticipated challenges, including the necessity for site-specific analysis, and evaluations regarding surface versus deep underground emplacement. Deep Fission will also examine the vulnerability or resilience of the reactor designs to flooding impacts and discuss considerations that go beyond the standard design parameters. This white paper is expected to be simplified due to the limited surface facilities that could be impacted by flooding.

3.8.3.7 Aircraft Impact and "Loss of Large Area" Requirements

Deep Fission will review both 10 CFR 50.150 on aircraft impact assessments, as well as 10 CFR 50.54 on aircraft impact threat and loss-of-large-area response. A white paper on this topic will be simplified and may be combined with flooding and other natural disaster response topics. Due to the reactor's emplacement approximately one mile below the surface, Deep Fission anticipates that aircraft impact and loss-of-large-area response will be minimal.

3.8.3.8 Instrumentation and Controls

Deep Fission may implement a digital instrumentation and control system and will prepare a comprehensive white paper on the cyber security implications and the potential for failure due to a software or hardware malfunction. All inter-channel and safety to non-safety digital system communication will be reviewed under applicable NRC regulations.

3.8.3.9 Accident Analysis Methodology

A white paper on the licensing basis events, the beyond design basis events, and other accident review methodology will be prepared for the NRC within the first year. Phenomena identification is currently underway. The ranking of risk through models and codes will be presented in the white paper. A review of RG 1.203, "Transient and Accident Analysis Methods," will be coordinated, with the risk-informed framework currently being applied to advanced reactors, along with an analysis of the implications of ANSI/ANS-30.3-2022, "Light-Water Reactor Risk-Informed Performance-Based Design." [Reference 5]

3.8.3.10 Probabilistic Risk Assessment and Risk-Informed, Performance-Based Regulatory Framework

Deep Fission will outline the probabilistic risk assessment, severe accident evaluation, and potential use of risk-informed, performance-based regulatory guidance. This outline will likely be combined with the accident analysis methodology paper listed previously.

3.8.3.11 Human Factors

After a review of NUREG-0700, "Human-System Interface Design Review Guidelines," and NUREG-0711, "Human Factors Engineering Program Review Model," it seems unlikely that a white paper will be required by Deep Fission on the subject of Human Factors. However, concepts related to this topic may be incorporated in future white papers.

3.8.3.12 Quality Assurance

Deep Fission may submit a topical report on the company's Quality Assurance Program Description (QAPD). This QAPD will significantly incorporate by reference previously approved quality assurance guidance such as RG 1.28, Revision 6, "Quality Assurance Program Criteria (Design and Construction)." At this time no alternative Quality Assurance (QA) programs nor use of other international standards are expected. The QA program will be implemented in Deep Fission within eighteen months of pre-application activities.

3.8.3.13 Concept of Operations

Deep Fission expects to submit a white paper on its departure from the traditional refueling schedule of pressurized light water reactors. This white paper will review the expected fuel cycle lengths, maintenance approaches, and inspection frequencies to be discussed in meetings with NRC staff.

3.8.3.14 Inspections, Tests, Analyses, and Acceptance Criteria and Design Acceptance Criteria

Deep Fission will request a meeting with NRC on inspections, tests, analyses, and acceptance criteria (ITAAC). These will be identified in the license application and are necessary and sufficient

to provide reasonable assurance that the facility will be constructed and operated according to the license. Site-specific ITAAC information will be provided in the COLA process.

3.8.3.15 Nuclear Insurance and Disaster Relief

No white paper or topical report is expected to address nuclear insurance and disaster relief. Deep Fission will seek offsite liability insurance as required by the Price-Anderson Act, with potential reduced risk due to the microreactor size when a Combined Operating License is granted.

3.8.3.16 Ownership and Financial Insurance

No white paper or topical report is expected on the specific issue of ownership and financial insurance. Deep Fission will meet the review standard of "appears to be financially qualified," set out by DG-9004, "Final Qualification for Power Reactors and Non-power Production or Utilization Facilities," for construction and operation when submitting a COLA. Deep Fission will maintain its financial qualification. Decommissioning funding and required assurances will apply to the COLA. Finally, there is currently no foreign ownership or control of Deep Fission and any changes, though unexpected, will be reported to the NRC immediately.

3.9 - NRC REVIEW TIMEFRAMES

The planned schedule of pre-application activities has been updated and is included in Appendix A, Planned Engagements and Submittals.

It is understood that the timeframe for review is subject to adjustment based on a variety of factors including the level of design complexity, which may be reduced by Deep Fission's use of known technology. Deep Fission may seek previously accepted exemptions but will otherwise work to minimize any alternatives to the traditional review acceptance criteria. Deep Fission will use topical reports supporting the application sparingly due to the generic schedule stating that these reports can take up to two years for review. For any and all responses to requests for additional information (RAIs), Deep Fission will respond within 30 days or less unless otherwise directed. Audits and staff reviews of procedures, detailed calculations, and data files are welcomed. An electronic reading room will be provided to NRC staff for data review.

4 - PRE-APPLICATION ENGAGEMENT

The following section will review information included in Section 3, Regulatory Strategy, and provide deeper context on relevant topics to a productive and successful pre-application phase. A discussion on the identification and prioritization of topics will be followed by a review of the expected types and frequency of interactions. Deep Fission's current expectations on NRC staff feedback and schedule considerations will provide an important baseline for interactions. Finally, the consideration and coordination of other reviews as well as preparation for site visits and audits will be described in this section.

4.1 - IDENTIFICATION OF TOPICS

If additional information on the topics described in Section 3, Regulatory Strategy, such as accident analysis methodology, seismic and flooding analysis, and emergency planning methodology would benefit the NRC staff, Deep Fission will provide it upon request. Additional topics for white papers and technical discussions are expected to be raised by the NRC staff and Deep Fission throughout the pre-application phase. Using a staged and adaptive licensing process, Deep Fission will seek to minimize its licensing risk by discussing topics early and often with the NRC staff.

4.1.1 - Regulatory Strategy

Deep Fission intends to submit a COLA in Fall of 2026. As a pressurized water microreactor, very few novel regulatory approaches will need to be considered. Exemptions or design-based review standards on topics, such as the lack of use of large surface containment structures, will be reviewed in depth with the NRC staff prior to submission of the application. Clarification on NRC staff access needs and required monitoring data will also be an early topic of discussion with the NRC staff, well in advance of application submission.

4.1.2 - Applicable Generic and Industry Issues

As mentioned in Section 3.8.1, Generic Issues, and 3.8.2, New Reactor Issues, Deep Fission will continuously review all generic impact issues. Coordination with industry partners and

organizations, such as the NEI, will allow Deep Fission to apply generic resolved issues. For example, an extensive surface containment structure was not required by licensees, such as NuScale, and a review of the methodology that allows this simplified design will be referenced if applicable.

4.1.3 - Applicable Design-Specific Issues

Design specific issues such as the deep borehole emplacement will be an important topic of discussion with NRC staff. Other design specific issues such as those described in Section 3.8.3, Selected Specific Issues, will be updated, identified, and resolved as early as possible. Design-specific impact issues, such as the use of natural convection, as used by prior license applicants, will also be discussed with NRC staff.

4.1.4 - Applicable Site-Specific Issues

Siting issues, such as seismic behavior, will be researched and will be reviewed with NRC staff as necessary.

4.1.5 - Prioritization of Topics

A prioritization of the topics for white papers and technical discussions to be held throughout the pre-application phase has not been finalized by Deep Fission at this time. Preliminary white papers will discuss the safety provided by deep borehole emplacement as well as the natural pressurization available at depth. White papers on the use of natural convection cooling and reactivity control systems, which have broad programmatic impact on the design, are also expected to be submitted within the first 18 months of engagement with the NRC. Besides technical discussions as described in these white papers, topics such as the QAPD description, SGI Program, and regulatory analysis will be prioritized.

4.2 - TYPES AND FREQUENCY OF INTERACTIONS

Deep Fission expects a variety of types of interactions with NRC staff during the pre-application phase. Early and frequent interactions with the NRC will help Deep Fission to minimize regulatory

risk. The novelty of the Deep Fission reactor is generally limited to its emplacement in a deep borehole, but with consistent communication to the NRC staff, Deep Fission expects to be able to successfully apply for a COLA no later than Fall of 2026.

4.2.1 - Routine Project Management Discussions

Deep Fission anticipates, at minimum, holding monthly interactions with the assigned NRC staff project manager. As the application nears submission, Deep Fission is prepared for multiple interactions in increasing frequency. Deep Fission requests notice of any rotation or change in assignment of NRC project managers with enough time to properly transition all information on the project. The Deep Fission schedule assumes a two-year pre-application phase and a two-year application phase, with the expectation that staffing at the NRC will remain relatively consistent throughout.

4.2.2 - Project Management "Drop-Ins"

Deep Fission will expect to have periodic "drop-in" visits with the NRC project manager, multiple members of the senior NRC staff, and Commissioners, during the pre-application and application review phase. As these meetings will be private, Deep Fission understands that no regulatory decisions will occur in these meetings. As Deep Fission holds monthly meetings with NRC staff, project management "drop-ins" are not expected to be needed frequently. All NRC meetings will be coordinated with the NRC project manager.

4.2.3 - Technical Discussions

The use of technical discussions early and often in the pre-application phase will allow Deep Fission to review and address any potential regulatory challenges with ample time to make necessary corrections. While initial introductory discussions are expected to be free, Deep Fission is prepared to receive invoices for the public meeting technical discussions. Once a full list of priority topics for review is established in coordination with the NRC project manager, Deep Fission may seek to consolidate related items to maximize efficiency during meetings. All meetings are able to be done via web conferencing or in person depending on the preference of the NRC staff.

4.2.4 - NRC Staff Familiarization

The highest priority for Deep Fission is to create a transparent, respectful, staged, and adaptive regulatory engagement with the NRC. To this end, Deep Fission will coordinate with its NRC project manager to ensure that the appropriate NRC staff are familiarized with the Deep Fission technical design and regulatory strategy in a timely fashion. The expectation is that early and re-occurring regulatory engagement with NRC staff will minimize potential points of failure in our licensing approval timeline that our prospective customers will rely on. This extensive REP and the conceptual design review white paper may be valuable assets to NRC staff assigned to the project.

4.2.5 - Written Submittals

Deep Fission anticipates submitting a series of white papers, and topical reports on the technical and regulatory topics mentioned throughout this REP. Since topical reports include a safety evaluation report and can be referenced by other license applicants, a systematic review of all such topical reports is currently in progress by Deep Fission. The complete list of topical reports expected to be incorporated by reference will be provided to the NRC within the pre-application phase. Deep Fission will provide a white paper to the NRC for review roughly every three months. As NRC staff comment on the white papers, the frequency and complexity of interactions regarding these white papers may change accordingly.

4.2.6 - Early Advisory Committee on Reactor Safeguards Engagement

As mandated by the Atomic Energy Act of 1954, The Advisory Committee on Reactor Safeguards (ACRS) has four main purposes including to review and report on safety studies and reactor facility license and license renewal applications; to advise the Commission on the hazards of proposed and existing production and utilization facilities and the adequacy of proposed safety standards; to initiate reviews of specific generic matters or nuclear facility safety-related items; and to provide advice in the areas of health physics and radiation protection. Deep Fission has reviewed the ACRS letter reports and public meetings of microreactor, small modular reactor, and advanced reactor license applicants.

As the application phase nears, Deep Fission will coordinate with NRC staff to prepare for ACRS discussions and review opportunities. As specific issues, such as deep borehole use of functional containment, are proposed and reviewed by the NRC staff, interactions with the ACRS may be beneficial to help increase familiarity with the topics being discussed and reviewed.

4.2.7 - Escalation of Issues

While a respectful and transparent relationship between Deep Fission and the NRC staff is Deep Fission's top priority, moments of technical and regulatory disagreement may occur. After initial responses and feedback are provided, an escalation to the NRC branch chief will follow a system of escalation based on NEI guidance.

4.3 - NRC FEEDBACK

Early and often engagement with the NRC staff is a high priority for Deep Fission. Extended feedback engagement is expected. Deep Fission values the NRC's feedback and will work to appropriately incorporate it. Each planned submission is expected to receive commensurate feedback to the level of applicability to the full application submission. With design maturity still under development, engaged feedback with the NRC staff will have a significant impact on Deep Fission.

4.3.1 - Feedback as a Function of Submittal Type

Deep Fission recognizes that planned submissions will receive varying levels of NRC staff feedback. The company has reviewed the Safety Evaluation Reports that are publicly available as feedback responses to approved topical reports. Due to the extensive review time, topical reports are expected to be used sparingly throughout the pre-application phase. Instead, NRC staff correspondence as feedback on white papers will be the primary form of feedback expected by Deep Fission. If approval of prior submitted reports with publicly available information is expected to be referenced, Deep Fission will coordinate the receipt of any feedback as to the applicability of the report to the Deep Fission design. Deep Fission will continue to review the NRC staff's "A

Regulatory Review Roadmap for Non-Light Water Reactors" as a reference on NRC staff feedback including the use of RAIs during the application phase.

4.3.2 – Finality

As Deep Fission is demonstrating its dedication to regulatory engagement in very early pre-application engagement, finality of design is not to be expected. As design maturity increases and technical readiness level rises, Deep Fission will continue to update the NRC staff through early and often regulatory engagement. Deep Fission has received feedback on its conceptual design review white paper and is in the process of incorporating NRC comments to prepare for our COLA submission. There is also a recognition that the white papers do not benefit from a safety evaluation report, unlike topical reports, but the staged and adaptive process being employed by Deep Fission finds the benefit of iteration to outweigh early finality.

4.4 - SCHEDULE CONSIDERATIONS

Deep Fission is aware of its comparatively early pre-application engagement with the NRC relative to other companies also seeking a license. With 25 small modular reactor applications expected by 2029, according to the NRC Commissioner's public remarks, the time and resource availability of the NRC staff is sure to be limited and a constraining factor. Consistent communication with the NRC project manager is expected.

The full schedule of planned submissions is included in Appendix A, Planned Engagements and Submittals. Not included in this schedule are the monthly meetings which will be coordinated and agreed to by the NRC project manager and Deep Fission. The expected duration of the NRC staff reviews will be coordinated with NRC project managers. If the NRC expects a longer duration of review to be necessary, Deep Fission requests notification of the expected length of duration for review within one month of the related submission. Deep Fission will be certain to update the schedule of planned submissions or meetings with the NRC project manager by email or during regularly scheduled meetings.

4.5 - RELATION TO NRC AND OTHER PROCEEDINGS

If Deep Fission forms a design center or working group, Deep Fission will consider any design-centered review coordination with a design center for a small modular PWR or microreactor. Other coordination that may be of benefit to the NRC staff during the pre-application phase will be considered when discussed with the NRC project manager. NEPA Consultation will be considered at site confirmation in the first quarter of 2025. All coordination will be handled promptly as recommended by the NRC staff.

4.6 - PRE-APPLICATION SITE VISITS, AUDITS, AND INSPECTIONS

During the pre-application phase, Deep Fission will comply with all requested visits, audits, and inspections. Deep Fission will maintain constant contact with the NRC project manager to determine the scope, schedule, and topics of any such visits, audits, or inspections.

4.6.1 - Quality Assurance

A QA program will be implemented as the COLA is developed. Deep Fission will be prepared for any audit or formal inspection of the QA program, which the NRC staff may deem necessary. A QAPD topical report, based on the applicable standards, will be submitted within six months of the submission of this revision of Deep Fission's REP.

4.6.2 - Testing

At this time, no testing or demonstration is expected to be required of Deep Fission, due to the use of standard pressurized water reactor components. If testing or demonstration is required by NRC staff, or if a determination based on the NRC staff's "A Regulatory Review Roadmap for Non-Light Water Reactors" indicates a need for testing, all applicable inspections or site visits to the testing facility will be coordinated with the NRC project manager.

4.6.3 - Site Selection and Site Characterization

Once a site is confirmed in the first quarter of 2025, Deep Fission will engage the NRC to plan visit, audit, and inspection schedules proactively with the company's NRC project manager.

4.6.4 - Security/Critical Infrastructure

Coordination with the Department of Homeland Security for a site visit is expected after site confirmation and construction planning begins. Coordination and incorporation of safeguards and security elements in the design will provide context for future site visits.

4.6.5 -Vendors/Suppliers/Supply Chain

As Deep Fission completes the design and engineering, key suppliers will be contracted. Audits of these vendors are expected following COLA submission. However, future revisions to this REP will update NRC staff with any details related to vendors, suppliers, and supply chain selection.

4.7 - BUDGET

Both Deep Fission and the NRC will communicate with each other regarding any important budgetary considerations while establishing and maintaining the COLA project schedule. Deep Fission recognizes that NRC fees and rates are subject to change. Estimated NRC staff review fees – including the number of review hours – are requested to be estimated at the time of acceptance for review, monitored on an ongoing basis, and retroactively audited to better inform financial planning.

5 - APPLICATION PROCESS

After pre-application engagement with the NRC, Deep Fission will submit a COLA no later than the Fall of 2026. The following section will outline Deep Fission expectations for the application process. This includes the readiness assessment audit, application submittal, application acceptance review

and docketing, and understanding of the critical NRC processes at the time of the submission of the application.

5.1 - READINESS ASSESSMENT AUDIT

Deep Fission intends to request a readiness assessment audit (RAA) no later than June 2026, approximately six months ahead of the submission of the COLA. While Deep Fission will coordinate sections of the application for RAA with the NRC project managers. During the audit process, Deep Fission expects the NRC staff to highlight and comment on issues that might prevent the acceptance and docketing of the application as well as areas of the application for which clarification could minimize requests for additional information. Observations made during the audit are non-binding, and care will be taken to prepare the application according to the standard review plan regulations for the greatest likelihood of application acceptance. Deep Fission recognizes that significant resources will be required for the audit and prefers to address any issues as early as possible as part of its staged and adaptive licensing process. In preparation for the audit, Deep Fission will review LIC-116, “Preapplication Readiness Assessment,” in detail.

5.2 - APPLICATION SUBMITTAL

As previously stated, Deep Fission expects to submit a COLA no later than the Fall of 2026. Any changes to the expected submission schedule will be given to the NRC staff as early as possible during the regularly scheduled meetings.

Deep Fission intends to submit all documentation electronically, rather than through a hard copy, but is willing to submit in whichever format the NRC prefers. A review of the e-submittal process has already been conducted, and non-application documents will be submitted electronically unless otherwise directed by the NRC. Non-docketed information requested by the NRC staff, such as internal calculations, procedures, and reports, will be available to the NRC staff through an electronic reading room.

5.3 - ACCEPTANCE REVIEW AND DOCKETING

Following the e-submittal of the application, Deep Fission expects NRC staff to perform an acceptance review according to 10 CFR 2.101, 10 CFR 52.136, and 10 CFR 52.137. Deep Fission recognizes that NRC staff will be reviewing the documentation provided to ensure the inclusion of sufficient technical information in scope and depth. Deep Fission will support the NRC staff where appropriate as the NRC conducts a detailed technical review of the application and expects that the NRC will complete the review on a predictable schedule. Deep Fission will refer to LIC-117, "Acceptance Review Process for New Nuclear Facility Licensing Applications" for review process guidance. Once an application review schedule is proposed by NRC staff, that schedule will be added to the REP. If the acceptance review progresses as anticipated, Deep Fission expects that the application will be docketed in late 2026.

6 - POST-APPLICATION ENGAGEMENT

While this REP is primarily concerned with the pre-application phase of engagement in preparation for the submission of a COLA, a brief review of post-application engagement is included with the understanding that updates to this section are likely as the application nears completion. The use of technical meetings and audits to assist in the review of the application will be discussed first, followed by the current understanding of the requests for additional information, and closing with the process for changes to the application or its review schedule.

6.1 - TECHNICAL MEETINGS

Deep Fission recognizes the need to meet consistently with NRC staff to discuss the many important technical features that provide safety benefits. While monthly meetings are being requested in the pre-application engagement phase, Deep Fission recognizes that technical meetings will likely become more frequent and may not be able to be scheduled on a routine basis after the COLA has been submitted. Deep Fission will maintain constant communication with the NRC project manager and make its staff readily available for in-person or web conference meetings at the NRC staff's

request. Deep Fission requests that all meetings be coordinated via email and understands that at least 10 days of advance notice will be needed for public access to these technical meetings.

6.2 - AUDITS AND INSPECTIONS

Along with technical meetings, audits and inspections can be scheduled at the NRC staff's request. Deep Fission expects these audits and inspections to increase in frequency following the submission of its COLA. Topics such as the use of below-grade functional containment and the simplified convective cooling system may be of interest for audit meetings. Further topics will be suggested as questions are raised by NRC staff in the pre-application phase.

6.3 - SUBMITTAL OF ADDITIONAL INFORMATION

Deep Fission recognizes that additional information may need to be submitted after its COLA submission. This might include supplemental information such as changes in organization or periodic mandated updates. Deep Fission is also aware of the RAI process and will be responding quickly to any such requests. Although unexpected, any significant revisions to Deep Fission's COLA will be communicated to the NRC staff as early as possible.

6.3.1 - Supplemental Information

During the NRC review of Deep Fission's COLA, it may become necessary to update certain information. Updates could be due to changes in the information initially provided, discoveries made during interactions with NRC staff, or periodically mandated updates.

It is essential for Deep Fission to maintain regular communication with the NRC staff project manager and ensure they are informed about any upcoming supplemental information well in advance. Deep Fission may choose to include scheduling details for significant updates, such as scheduled periodic revisions to the application, to streamline the process.

6.3.2 - Requests for Additional Information

The use of RAIs is a well understood process for sharing additional information with the NRC staff to complete an application review. Deep Fission has reviewed LIC-115, "Processing Requests for Additional Information," in depth and is prepared to answer any RAIs from the NRC project manager. Following a draft RAI request via email, Deep Fission will identify any proprietary information (which is expected to be minimized) and then discuss any clarification of the requested information. Deep Fission will respond within 30 days unless the RAI is severely complex. Deep Fission will notify the NRC project manager as soon as possible if an RAI is expected to require more than 30 days to respond to. Assuming that an RAI may impact the application, Deep Fission will provide a marked-up version of the COLA that includes all RAI impacts.

6.3.3 - Application Revisions and Updates

Following the submission of the COLA. The FSAR will require annual updates while under review, as mandated by 10 CFR 50.71(e)(3)(iii). Although there is no specific regulation dictating the minimum update frequency for a COLA, Deep Fission understands the necessity of periodically revising its applications. Revisions will include incorporating any changes resulting from RAIs up to a predetermined point before formal revision. Deep Fission's top priority is remaining current and compliant with regulatory requirements to ensure the integrity and safety of our applications.

6.4 - FREQUENCY OF INTERACTIONS

Deep Fission understands the significance of pre-application and post-application engagement with the NRC and currently meets once per month with the NRC. These meetings allow an assessment of schedule performance with the NRC project managers and related staff. Deep Fission also recognizes that more frequent meetings may be necessary in the future.

6.5 - REVIEW PHASES AND SCHEDULE

Deep Fission has reviewed the process of acceptance and docketing as well as the review schedules of other companies that have previously applied for licenses before the NRC. Deep Fission has estimated a COLA review of 24 months.

6.6 - RELATIONS TO OTHER PROCEEDINGS AND REVIEWS

Deep Fission intends to file a single initial COLA and will coordinate RAIs and work to resolve any outstanding technical issues in coordination with the NRC on an ongoing basis.

7 - WITHHELD INFORMATION

The amount of information to be withheld from the public will be minimized to the greatest extent possible. While other companies have previously sought to withhold even the REP itself, Deep Fission has drafted this REP and the subsequent technical reports and application with the recognition that the public has a right to access any information that is not security-sensitive in nature. Nonetheless, Deep Fission reserves the right to request that security-sensitive information or proprietary information is withheld from the public. If the NRC staff determines that certain information must be withheld, Deep Fission will comply with this direction and protect and control that information.

7.1 - CLASSIFIED INFORMATION

Deep Fission is not seeking to handle classified information, national security information, nor restricted data. The current application does not consider the use of special nuclear material and intends to use LEU procured from a certified nuclear vendor. Although multiple personnel for Deep Fission have maintained security clearances in the past, these clearances are not expected to be required for the COLA process.

7.2 - SAFEGUARDS INFORMATION

While classified information will likely not be required to be shared or handled, SGI programs will be properly managed according to 10 CFR 73, "Physical Protection of Plants and Materials," RG 5.79, "Protection of Safeguards Information," and the NRC's "Guide to Marking Safeguards Information." An SGI program will be established within 18 months of the pre-application process to prepare for possible future disclosure of design-basis threat information.

7.3 – SENSITIVE UNCLASSIFIED NON-SAFEGUARDS INFORMATION AND SAFEGUARDS INFORMATION

The protection of sensitive unclassified non-safeguards information (SUNSI) will be controlled similarly to the SGI program and will also be established within the first 18 months of the pre-application process. Personnel privacy, attorney communications including patent disclosures, and similar information will be withheld from public disclosure. Information security will be managed by Deep Fission Chief Operations Officer until a Chief Information Officer is hired.

7.4 - WITHHOLDING INFORMATION FROM PUBLIC DISCLOSURE

Deep Fission will strive to minimize the amount of withheld information from public access, within reason. The identification and justification for withholding information is determined by the regulatory guidance provided in 10 CFR 2.390. A detailed review of 10 CFR 2.390 will be completed within the first twelve months of the pre-application process and any requests for clarification will be raised with the NRC staff.

7.5 - OTHER INFORMATION CONTROL REQUIREMENTS

Deep Fission has considered a variety of other types of information that may need to be controlled under regulations of a US agency that is not the NRC. Deep Fission has determined that such information is not subject to an NRC request for withheld public information as the information will be reviewed by the regulations of another agency, if present. For example, with regard to import or

export control activities by Deep Fission, the company will apply for the appropriate license governed by 10 CFR Part 110 or Part 810, as required. Should Deep Fission seek to engage in in any physical export of its nuclear products or services, it will apply for a license under Part 110 and request a license under Part 810 for technology transfers to non-US citizens, if no exemption or waiver applies. Similarly, applied technology labeling has not been applied to any currently relevant Department of Energy research and will not need to be withheld from the application or from public disclosure. Finally, as Deep Fission is not currently under contract with any government agency, the use of official-use-only withheld information will not be relevant.

8 - REFERENCES

1. Deep Fission, Inc., “Deep Fission, Inc., Response to NRC Regulatory Issue Summary 2020-02,” March 12, 2024.
2. Nuclear Energy Institute, “Guidelines for Development of a Regulatory Engagement Plan,” NEI 18-06, Rev. 0, June 2018.
3. GfK, “Nuclear Waste Study State Survey Highlights,” 2018.
4. Electric Power Research Institute, “Advanced Nuclear Technology: Advanced Light Water Reactor Utility Requirements Document,” Revision 13, December 2014.
5. ANSI/ANS-30.3-2022, “Light-Water Reactor Risk-Informed Performance-Based Design,” 2022.

APPENDIX A: PLANNED ENGAGEMENTS AND SUBMITTALS

The tables below provide Deep Fission's expected timeline for planned submittals and engagements with the NRC.

Table A-1. Planned Submittals

Expected Date of Submittal	Title	Description
February 2025	Principal Design Criteria	Licensing Topical Report that describes the Principal Design Criteria specific to the Deep Fission reactor design.
March 2025	Regulatory Analysis	White Paper that describes compliance and conformance with regulations and guidance issued by NRC.
April 2025	Quality Assurance Program Description	Licensing Topical Report that describes Deep Fission's QA Program and its conformance with RG 1.28.
June 2025	Probabilistic Risk Assessment (PRA) Methodology	Licensing Topical Report or White Paper that describes the Probabilistic Risk Assessment methodology.
September 2025	Mechanistic Source Term Methodology	Licensing Topical Report or White Paper that describes fission product release analysis.
December 2025	Fuel Qualification and Testing	Licensing Topical Report or White Paper that describes the process for certifying fuel use.

Table A-2. Planned Engagements

Expected Date of Engagement	Title	Description
March 2025	Quality Assurance Program Description Readiness Assessment	NRC to perform a readiness assessment prior to submittal of Deep Fission's QAPD, Revision 1.
June 2025	Environmental Engagement – Land Use, Water Resources, Aquatic and Terrestrial Ecology	Public meeting to discuss environmental topics listed.
August 2025	Environmental Engagement – Historic and Cultural Resources	Public meeting to discuss environmental topics listed.
October 2025	Environmental Engagement – Socioeconomics and Environmental Justice	Public meeting to discuss environmental topics listed.
November 2025	Seismic Issues	Public meeting to discuss the impact of seismic activity.