USNRC Project No. 99902094

REGULATORY ENGAGEMENT PLAN
FOR
SUBMITTAL AND APPROVAL OF AN APPLICATION
TO
CONSTRUCT A NEW RESEARCH REACTOR

submitted by

THE UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

Illinois Microreactor RD&D Center

in collaboration with

NANO Nuclear Energy Inc.

to

U.S. NUCLEAR REGULATORY COMMISSION

Office of Nuclear Reactor Regulation

Division of Advanced Reactors and Non-Power Production and Utilization Facilities

17 June 2025

Project Control Information

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04	8/3/2022	C. Brooks/ Z. Rad/J. Razvi	Update schedule and other minor updates
05	6/26/2023	T. Grunloh/ L. Foyto/ C. Brooks/ Z. Rad	Update schedule, replace test reactor with research reactor, update power level and other minor updates
06	6/15/2025	T. Grunloh	Update schedule. Reflect Participation of Nano Nuclear Energy Inc.

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Document Approvals

Approvals	Name/Organization	Title	Signature	Date
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1 INTRODUCTION

The University of Illinois Urbana-Champaign (University of Illinois, University or UIUC) informed the U.S. Nuclear Regulatory Commission (USNRC), Office of Nuclear Reactor Regulation, of the University's intent to deploy a Research and Test Reactor (RTR, also referred to as a "non-power reactor")[1] on the UIUC campus. UIUC's intent, expressed in the Letter of Intent (LOI) is to submit an application for a Construction Permit (CP) for a RTR facility on the UIUC campus [1]. In the intervening period since the LOI, UIUC has clarified that the operational intent of the facility will be aligned with the regulatory definition of Research Reactor. UIUC will be the owner-operator of the proposed reactor, to be licensed and operated as a Class 104(c) "production or utilization facility" described in 10 CFR 50.21(c). The reactor will be classified as a research reactor as defined in 10 CFR 50.2. UIUC plans to submit the CP application as permitted under 10 CFR 50.23 and in accordance with the Atomic Energy Act (AEA), as amended, Sections 31 and 104(c).

The proposed research reactor is the KRONOS Micro-Modular Reactor (MMR™), a High Temperature Gas-Cooled Reactor (HTGR) design developed by NANO Nuclear Energy Inc. (NANO)[2]. UIUC's proposed facility meets all the applicable requirements of the AEA Section 104 and 10 CFR 50 for a research reactor. The KRONOS MMR™ will be designed, constructed, operated, and utilized for research and training and to further advance reactor technology demonstrations and operations. This will be documented in UIUC's application for a CP and, subsequently, for an Operating License (OL).

The UIUC team is pleased to submit this Regulatory Engagement Plan (Plan) including a project description, our proposed regulatory strategy, anticipated timeline for implementing our plan and other related tasks to maintain an effective engagement with USNRC staff throughout the licensing process. In the preparation of this plan, we have taken into account applicable guidance in NEI 18-06[3], USNRC's Pre-application Engagement guidance [2] which encourages early interactions by staff with prospective applicants and developers of advanced reactors in accordance with the Advanced Reactor Policy Statement [73 FR 60612, October 14, 2008]. The Plan also provides information that satisfies, in part, the applicant information requirements of 10 CFR 50.33(a) – (e) and 10 CFR 50.34(a). It is recognized that additional information in this regard will be required as part of the application to construct and will be provided as part of the Preliminary Safety Analysis Report (PSAR).

As described herein, we intend to engage with USNRC staff in pre-application discussions through various meetings, submission of Topical Reports, White Papers, and engaging in dialog on USNRC's positions and inputs on the technology, the facility, utilization and regulatory challenges for deploying the KRONOS MMR™ research reactor on the UIUC campus prior to the full submittal of the application. We intend to use established USNRC guidance in NUREG-1537, as amended through USNRC's Interim Staff Guidance (ISG) [3],[4], and other guidance as applicable, in the preparation of the Preliminary Safety Analysis Report (PSAR).

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[1] The terms Research & Test Reactor and Non-Power Reactor may be used interchangeably to refer to the proposed facility.

[2] https://nanonuclearenergy.com/

[3] *"Guidelines for Development of a Regulatory Engagement Plan,"* Nuclear Energy Institute, NEI 18-06, Rev 0, June 2018

2 PRIMARY CONTRIBUTING INSTITUTIONS AND POINTS OF CONTACT

2.1 University of Illinois Urbana-Champaign

UIUC is a public land grant research university in Illinois, founded in 1867 and located in the twin cities of Champaign and Urbana. The Department of Nuclear, Plasma and Radiological Engineering (NPRE) is one of twelve departments in UIUC's Grainger College of Engineering. UIUC is a non-profit educational institution, as defined in 10 CFR Parts 170.3 and 171.5.

UIUC will be the owner and operator of the research reactor and related facilities, and as such will be the USNRC licensee of record. UIUC, supported by Nano, will be responsible for the preparation and submittal of the CP application and all pre-application and post-application activities, as well as manage the eventual construction and commissioning of the KRONOS MMR™ and related support facilities.

The Department of Nuclear, Plasma, and Radiological Engineering (NPRE) was the home of one of the early non-power reactors, a TRIGA Mark II reactor which has been successfully decommissioned and the site released for unrestricted use. UIUC successfully and safely operated the TRIGA in the heart of campus for 38 years (1960-1998), and its fuel was safely stored on-site until 2004. The UIUC TRIGA accounted for many "firsts" in the annals of nuclear engineering through its operating history. The reactor site's restoration to greenfield status demonstrates UIUC's abilities at every stage of reactor licensing, construction and operations, and final decommissioning. The Department also operates the Hybrid Illinois Device for Research Applications (HIDRA), a small-scale tokamak fusion reactor. The University also has extensive experience in managing, developing, and carrying out large technology and construction projects. University capital projects can total over $500M at any given time.

Key points of contact for the regulatory engagement with USNRC are:

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2.2 Nano Nuclear Energy Inc.

NANO Nuclear Energy Inc. (NANO) was founded in 2022 and is a 100% U.S.-owned entity, incorporated in the State of Nevada and headquartered in New York, NY. The company is a leading nuclear technology developer that includes design and development of advanced nuclear reactors, nuclear fuel manufacturing and transport, as well as other advanced nuclear technologies for terrestrial and outer space applications.

NANO's flagship product is a very small HTGR, the KRONOS MMR™, based on TRISO microsphere fuel form compacted in Fully Ceramic Micro Encapsulated (FCM™)[4] compacts. NANO's other reactor products include transportable microreactors for both mobile and stationary applications for data center, artificial intelligence and quantum computing, crypto mining, military applications, disaster relief,

[4] FCM is a registered trademark of Standard Nuclear, Inc.

transportation (including maritime shipping), mining projects, water desalination and green hydrogen plants, and lunar power and space exploration.

Key points of contact for the regulatory engagement with USNRC are:

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The licensee (UIUC) and reactor designer (NANO) teams will be supported as needed by specialist teams from industry in the preparation of the license applications.

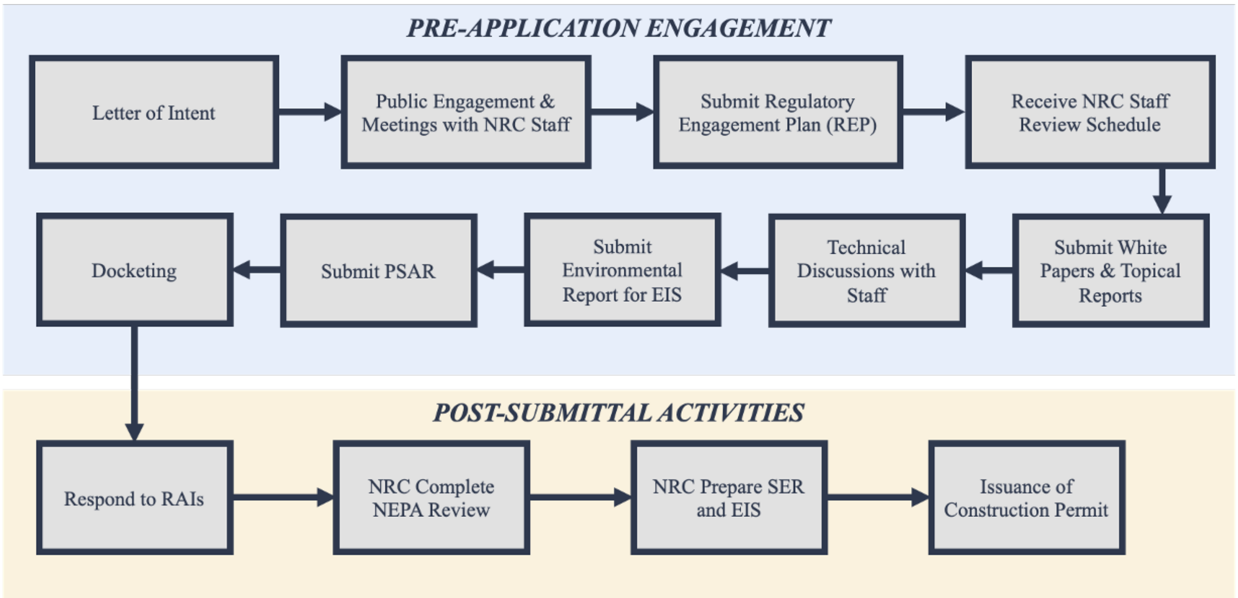
3 OVERALL STRATEGIC APPROACH – REGULATORY PATHWAY

Exhibit 3-1 shows a high-level flow chart that UIUC (applicant) and NANO (reactor designer) propose for engaging with USNRC in the conduct of a full range of activities from submittal of this document, to submitting a CP. The chart also presents pre- and post-submittal engagements, to achieve the desired result of receiving a USNRC permit to prepare the proposed site and construct the research reactor.

The University's efforts to deploy a Gen IV microreactor based research reactor at UIUC, with the goal, in part, to replace and enhance the capabilities lost because of the decommissioning of the TRIGA Mark II non-power reactor, have been ongoing since August 2019 (see Section 6). Regulatory engagement prior to the submittal of the LOI has been primarily to determine the suitability of the research reactor pathway in licensing a microreactor, given the broad nature of research the campus is planning.

The University is not planning any commercial activity but is interested in demonstration of power production and integration into the existing University owned and operated electricity and steam production system as allowed under a research reactor license consistent with the definition under the Atomic Energy Act and meets the requirements of 10 CFR 50.22. There is no intention that the power production be used as a commercial product and sold by the University, but rather as part of the facility's research and training activities. Preliminary site evaluations have already been performed for the research reactor deployment and primary and alternative siting locations for a Gen IV microreactor have been identified. These evaluation criteria include geotechnical considerations, location relative to protected lands, location relative to other hazardous facilities, local population density, and location relative to essential services. Towards the goal of licensing a Gen-IV microreactor on the campus site, the Letter of Intent (LOI) was submitted by UIUC [1] to the USNRC Office of Nuclear Reactor Regulation, expressing the University's intent to deploy a research reactor using Nano's KRONOS MMR™ HTGR technology.

Exhibit 3-1: Proposed Licensing Process through Construction Permit Issuance



3.1 Pre-Application Activities

Taking guidance from NUREG-1537 as amended [3][4], the license application activities will be structured to allow for pre-application safety analyses, independent assessments of the reactor, development and submittal for review of Topical Reports, White Papers, and site-specific studies including environmental studies. Furthermore, all activities associated with the application will be compliant with the applicable quality requirements. A graded approach commensurate with the proposed Gen-IV technology and KRONOS MMR™ specific design will be followed in the application of these requirements.

3.2 Post-Submittal Activities

Post-submittal activities include providing timely support, as requested, to USNRC staff in the review of the application. These include:

- Responding to Requests for Additional Information (RAIs) in a timely manner
- Supporting additional USNRC meetings that may be required in support of the application
- Providing necessary additional information, upon request, in the preparation of supporting USNRC documents, leading up to the issuance of the CP
- Hosting a site visit by USNRC staff to enhance site knowledge and engage the public

The project team will strive to submit responses to RAIs and other necessary information within agreed upon timeframes to ensure that the USNRC review schedule is not adversely affected.

4 USNRC-APPLICANT TEAM COMMUNICATIONS PROTOCOLS

Effective and clear communication between UIUC, NANO, USNRC, and other project partners during various phases of the application (pre-submittal/submission/post-submittal) will play an important role in smooth and timely resolution of safety significant issues and timely completion of the license-to-construct process. The applicant team anticipates active communication with the USNRC throughout the licensing process. The frequency and mode of communication will vary based on the needs and availability of the

USNRC and applicant team. The applicant team can accommodate teleconference, video conference, and in-person meetings at the preference of the USNRC.

4.1 Oral Communications

Non-public drop-in meetings will be sought for non-technical discussion where either the applicant team or the USNRC would benefit from clarification of general information such as schedule and status updates and planning for future communication. Public meetings, held on and off campus, will provide opportunities to discuss the project details and, whenever possible, the technical aspects of the technology and planned deployment. Drop-in meetings will be supported by presentations from the applicant team.

4.2 Written Communications

Written communications during preapplication are expected in the form of email, presentations (from drop-in or public meetings) and Topical Reports in order to support the CP application submission. Email is the preferred method for all general correspondence. White Papers will be used to describe the applicant team's position on a specific issue in order to facilitate alignment with USNRC staff. White Papers will largely focus on high-level topics central to the technology and deployment approach and can clarify the need for more detailed Technical or Topical Reports. Additional White Papers and/or Technical Reports will be provided as needed based on the ongoing pre-application engagement with staff.

4.3 Public Participation

The protocol for participation of the public (except for commercially sensitive or security-related matters which may be withheld under 10 CFR 2.390) during the licensing process including the meetings, access to documents, USNRC-sponsored information sessions and scoping meetings, review of USNRC safety evaluations, environmental review, and hearings, will be defined based on the USNRC guidance. To the maximum extent practical, the applicant team will make materials and discussions available for public access.

5 PROJECT STRUCTURE

UIUC is developing and deploying the KRONOS MMR™ as a campus resource to take advantage of the diversity of expertise and spirit of innovation across all relevant areas of science and technology at the University of Illinois. The University also plans to partially re-power its fossil fuel fired Abbott Power Plant with the KRONOS MMR™ Energy System to provide a zero-carbon demonstration of district heat and power to campus buildings as part of the facility's research and training activities, and in support of the campus carbon reduction initiative. The project team aims to demonstrate how microreactor systems integrate with existing fossil fuel infrastructure to accelerate the decarbonization of existing power-generation facilities. Undergraduate and graduate students participating in the program will gain the technical knowledge to contribute to the global transition from carbon intensive energy sources using these reactor deployments.

In addition to supporting the University's clean energy goals, the proposed research reactor will serve as an innovative and valuable workforce training tool for a new generation of nuclear scientists, engineers, and operators. UIUC's decommissioned TRIGA reactor that served this purpose operated for 38 years with a site license in the heart of campus. UIUC now proposes the deployment of a next-generation energy research facility for training the emerging clean-energy focused workforce.

The licensing effort will be carried out and supported through collaborative efforts with major U.S. industry partners in nearly all aspects of the analysis, design, licensing, construction, and operations.

NANO will be a full collaborative partner in all phases of the project as the KRONOS MMR™ designer, technology provider and vendor of record. Other partners may be added for specific tasks and expertise, as needed during execution.

6 PROJECT BACKGROUND

UIUC has worked to position the campus to be an early site for microreactor technology deployed as an advanced research reactor. This effort has included engagement with campus students, staff, and administration; local community; regulatory bodies; the nuclear industry and broader nuclear community; and local, state, and federal governments. Public engagement and community awareness have been prioritized from the project's inception and will continue to be a priority. These engagements have helped to shape many aspects of the applicant team's approach, including the vendor partner, potential reactor sites, and planned reactor use.

6.1 Technology

The design of the proposed UIUC research reactor derives from HTGR technology that has been deployed worldwide (Germany, United States, Japan, and China) since the late 1960s. HTGR designs have also been developed as advanced modular and direct power conversion designs for electricity and process heat applications, some of which have been previously reviewed by, and documented with, USNRC as part of prior pre-application licensing engagements. These include the Modular HTGR (MHTGR) [5], the Next Generation Nuclear Plant (NGNP) [6] and the Gas-Turbine Modular Helium Reactor (GT-MHR). In addition, a HTGR based research and test reactor (RTR), the High Temperature Teaching and Training Reactor (HT3R) was proposed and designed for the University of Texas at Permian Basin [7].

6.1.1 The KRONOS MMR™ Reactor and Energy System

The UIUC research reactor will use NANO's KRONOS MMR™ high temperature and inert gas-cooled reactor-based energy system that combines a nuclear reactor and associated heat transport system ('Nuclear Plant') and an 'Adjacent Plant' that are physically and functionally separated. This "split" design feature can simplify the regulatory review process which allows for a fully standardized RTR to be built in combination with a non-nuclear power conversion system. It can be tailored to suit a variety of applications including supplying electricity, high-grade process heat, low-grade district heating/cooling, or any combination thereof (cogeneration). The use of molten salt as a thermal energy storage medium makes this split feasible, as it effectively decouples the reactor from the energy utilization side of the system.

Key features of the KRONOS MMR™ technology include:

<u>Simplicity</u>: The KRONOS MMR™ design ensures simplicity and plant safety is completely assured by intrinsic and inherent means. Simple for public acceptance, simple to license, simple to build and simple to operate.

<u>Design Approach</u>: The KRONOS MMR™ is designed to incorporate proven and mature technology to the greatest extent practical. Components are selected based on available commercial suppliers. The primary loop components have been used in previous HTGR designs (graphite blocks, vessels, control rods) or oil and gas plants (printed-circuit heat exchanger, circulator with electromagnetic bearings). The molten salt intermediate circuit is based on the same conditions and components used in concentrated solar power plants. The steam circuit is based on conventional superheated steam turbine technology. The safety characteristics of small HTGRs have also been demonstrated by previous operating HTGRs.

In summary, the KRONOS MMR™ facility is an inherently safe, and proliferation-resistant design that addresses all the key parameters to development and deployment of advanced reactors with extensive commercially available off the shelf components.

6.1.2 The KRONOS MMR™ Reactor Design Characteristics

The KRONOS MMR™ reactor design and technology for deployment as a research reactor at UIUC is based on physics characteristics and design features that make the reactor inherently safe:

- Inherent (core-wise) and intrinsic (plant-wise) safety that obtained by 1) high retention of fission products in the TRISO fuel particles; 2) controlling the reactor reactivity via a large negative temperature coefficient; and 3) the large heat capacity of the all-graphite core and removal of residual heat from the core via a passive heat transfer path.
- Assurance of negligible radioactive fission product release that requires no electrical power, no active systems, and no operator action.
- By using either HALEU or LEU+, thereby achieving greater burnup and long core lifetimes, end-of-life used fuel volumes are reduced. The KRONOS MMR™ design considerations for average burnup allow the KRONOS MMR™ reactor to essentially operate as a nuclear battery. As a result, it offers proliferation resistance, no fresh fuel or spent fuel needs to be stored on site during the operating life and there will be no access to the core during the operating life.

Exhibit 6-1: Major Characteristics of KRONOS MMR™ RTR Design

Microreactor Parameter	KRONOS MMR™
Reactor core	Prismatic shaped, stacked graphite fuel blocks that hold the fuel and allow passage of reactor coolant through the core.
Reactor fuel	TRISO coated, HALEU or LEU+ U-235 UCO fuel kernel encapsulated in FCM™ fuel compacts.
Reactor coolant	Helium
Fuel Handling System	The reactor is anticipated to be refueled several times throughout its lifetime. A fuel handling/refueling SSC is included as part of the facility. The machine is movable and is positioned above the reactor core unit solely during refueling operations.
Experimental Access Points	None. The KRONOS MMR™ is not intended for irradiation experiments or isotope production.
Confinement / Containment	TRISO. Functional containment concepts and confinement principles are included in the nuclear building design. No above grade traditional pressurized containment structure is planned.
Reactivity Control	Burnable poisons, and 7 control rod units containing B_4C.
Heat transfer mechanism	Heat is transferred from the fuel compacts to the helium. The helium is circulated through the core, transferring the heat through a heat exchanger to the molten salt energy storage system for other non-nuclear uses.
Amount of heat loss from reactor	The reactor has [<500 kWt] of heat dissipated to the environment.

Microreactor Parameter	KRONOS MMR™
Method of heat loss disposal	The reactor has a Reactor Cavity Cooling System (RCCS) that removes heat from the reactor cavity.

6.2 Siting

6.2.1 Completed Siting Studies

In early 2020, UIUC began an effort to plan, license and operate an advanced nuclear reactor as a research reactor at UIUC. The overall goal of the project is to deploy the research reactor at UIUC by late 2020s. To date, UIUC has conducted numerous engagement activities to raise awareness of the project and has gained support from the University, surrounding public, and state and federal stakeholders. UIUC has performed initial evaluations for siting and integration of a microreactor for testing, research, training, and production demonstration. These assessments included an initial siting assessment with the Oak Ridge Siting Analysis for power Generation Expansion (OR-SAGE) tool [8], and an in-depth study through Middough Inc. [9] of construction requirements and integration of the reactor unit with the existing campus facilities and power plant.

The scope of the study performed by Middough Inc. included the geological excavation required for the below-grade reactor installation, reactor building and adjacent plant layout, the integration of the adjacent plant with the existing Abbott Power Plant for delivery of steam and feedwater return, and the refurbishment or new construction of a co-located microreactor education and research center. The preliminary engineering assessment cited no major construction challenges or issues related to integration with existing facilities.

The scope of this Plan is limited to completing all regulatory requirements with the USNRC to obtain a CP under 10 CFR 50 regulations for RTRs. Subsequent follow-on regulatory activities necessary for deployment, i.e., obtaining a USNRC operating license are not in the scope of the current application being planned for submittal herein, however the application schedule includes an indicative timeframe for future follow-on regulatory engagement towards deployment.

6.2.2 Preparation of Environmental Report

Working with USNRC guidelines, subject matter experts from UIUC and other specialists on the team will develop and prepare the required ER for the proposed site. The subject matter experts will collect and evaluate the sufficiency of the existing data relevant to the resource areas. An annotated outline will be prepared, and information needs will be identified. It is anticipated that some baseline field studies will need to be conducted, and reports will need to be prepared. These studies include baseline noise studies, a traffic study, and various confirmatory visits.

A Cultural Resources Survey and a Historic Architecture Survey may also be required. In addition, due to the age of the UIUC campus (founded in 1867), the ER will need to consider the Historic Architecture context of the University and any impacts associated with construction and demolition activities. The ER will include criteria and justification relating to the site selection process and alternatives. The ER and Chapter 2 of the PSAR will be prepared accordingly.

6.3 Quality Assurance

A Quality Assurance Program Description (QAPD) for the Project has been approved through USNRC review. The QAPD describes UIUC’s methods and establish quality assurance and administrative control requirements that meet 10 CFR 50.34 based on the criteria of ANSI/ANS-15.8-1995, "Quality Assurance Program Requirements for Research Reactors," (ANSI/ANS-15.8).

The QA program for the various phases of this project will include requirements for a construction work plan and contractor management and oversight during the execution of project related work.

7 REGULATORY STRATEGY

7.1 Pre-Application Submittal Regulatory Engagement

7.1.1 Public and Non-Public Meetings

The applicant team expects to maintain open and frequent coordination with the USNRC staff and other stakeholders by participating in meetings and discussions during the licensing process to maintain consistent understanding about the project status. Non-public drop-in meetings will be used for general non-technical discussions about process and planning. Public meetings will be utilized for technical discussion related to the licensing application submittal and for response to submitted White Papers, Technical Reports, and Topical Reports. Emails and letters may be used for scheduling or cost discussions, policies, procedures, or technical information that is self-evident without support information.

White Papers, Technical Reports, and Topical Reports will be used to obtain preliminary information on an official USNRC position or, if requested, a formal regulatory decision on the applicability of a regulatory requirement. These may include conclusive or binding interpretations.

7.1.2 Topical Reports and White Papers

UIUC and the reactor vendor NANO will prepare documents for early submission and review by USNRC. These submissions will improve application efficiency through USNRC review and approval of operational requirements and analysis methodologies. Proposed topics would include the design of key SSCs, methods, codes, operational modes. The currently expected topics include (topics proposed as White Papers (WP) and Topical Reports (TR) are identified as such):

- Justification for Class 104(c) License Category (WP)
- Detailed contents of PSAR in accordance with NUREG-1537 (WP)
- Quality Assurance Program Description (TR)
- Applicability of Nuclear Regulatory Commission Regulations (TR)
- Fuel Qualification Methodology (TR)
- Safeguards Information Protection Plan
- Event Sequence Identification and SSC Safety Classification Methodology (TR)
- MMR Principal Design Criteria (TR)

Once the TRs and WPs are submitted, UIUC will respond to RAIs from USNRC staff on the content of the submittals. If other submittals, either as TRs, White Papers or Technical Reports are deemed to be necessary for the conduct of USNRC's pre-application review of the proposed project, they will be discussed and prepared for staff review. The USNRC's Safety Evaluations will be used in subsequent application material for the project as a technical basis.

7.1.3 Site Visits

During the licensing process, UIUC and the vendor NANO would welcome site visits by the USNRC staff for smooth progress, clear communication, and timely resolution of safety concerns identified during the review of the application documentation. Pre-application site visits and audits can be supported as needed by the USNRC and any other regulatory body.

7.1.4 Site Specific Issues and Environmental Impact Statement

An important part of the licensing process is the review of site characteristics to verify impact of reactor operation on the environment and vice versa. The applicant team expects to have discussions with the USNRC staff during the pre-application phase to ensure all requirements for a complete environmental review are met. The applicant team is currently following the Chapter 19 "Environmental Review" Interim Staff Guidance (ISG) based on NUREG-1537 Parts 1&2 as compliance for 10 CFR 51.21. In addition, the applicant team intends to work closely with the USNRC staff to confirm appropriate site data needed for the Environmental Impact Statement (EIS).

7.1.5 Interpretations

As an early deployment of the HTGR technology within the RTR fleet and given the lower experience level of the USNRC staff relative to aqueous reactor designs, UIUC and NANO may require regulatory interpretations to support the CP application and ensure a successful application review. 10 CFR 50.3 and 10 CFR 52.2 may be utilized as needed to obtain official positions of the USNRC on the applicability of certain regulatory requirements. Timely staff responses will ensure project timelines can be met and a complete application is submitted.

7.1.6 Proposed CP Application

A significant portion of the initial NUREG-1537 format PSAR is proposed to be obtained from documentation that is already under development by Nano, and that will be significantly advanced to benefit the PSAR for preparation under NUREG-1537 format and content guidance. Revisions to address gaps, details specific to NUREG-1537 guidance, and site-specific aspects will be developed as needed to provide a complete PSAR for USNRC review. In this regard, key main focus areas are expected to be site specific analyses, the use of codes and standards, documenting the accident analyses, and codes used for modeling in accordance with USNRC guidance.

7.1.7 Pre-Application Readiness Assessment

Prior to submission, UIUC will engage with the USNRC staff to conduct a pre-application readiness assessment of both the safety and environmental aspects of the application. The results of the assessment will be used to finalize the application and assist USNRC staff with planning and resource allocation for the application review.

7.1.8 Post-Application Submittal Regulatory Engagement

As described in Section 3, post-application engagement with the USNRC staff will include, but not limited to:

- Responding to RAIs in a timely manner,
- Support for additional USNRC meetings that may be required in support of the application,
- Providing necessary additional information, upon request, in the preparation of supporting USNRC documents, leading up to the issuance of the CP,
- Support and participate in public meetings upon request by USNRC project staff.

8 PROPOSED SCHEDULE AND TIMELINE

The proposed CP application licensing schedule has been developed based on the USNRC established generic milestone schedules for license review. Preapplication activities will be carried out over the initial periods with a strong focus on the preparation of Topical Reports and White Papers, as applicable, for review and discussion with USNRC staff. In parallel, the applicant will conduct the environmental review, prepare an environmental report, and prepare the PSAR. The PSAR will be finalized based on interactions and considerations arising from the Topical Report and White Paper engagements with USNRC Staff. Table

8-1 provides the anticipated timeframe for the submittal of the CP application, Topical Reports, and White Papers. Further detail and updates to the timing of these planned submittals will be provided during planned interactions with the NRC staff (Section 4.1 and 4.2).

The CP application represents the initial phase of the reactor deployment. Subsequent phases include the operating license application, detailed design of the UIUC adjacent plant facility and training facility, fuel supply, and manufacturing as well as plant construction. The UIUC team will collaborate with USNRC staff to establish a specific schedule for this project based on the specific pre-application activities identified herein that optimizes the review schedules for this phase, as described in USNRC's pre-application guidance [2].

Table 8-1: Proposed Submittals and Timeline

TOPIC	TYPE	Estimated Submittal Timeframe / Approved Date
Applicability of 104(c) Licensing Path	WP	Submitted: June 2022
Proposed contents of PSAR in accordance with NUREG-1537	WP	Submitted: August 2022
Quality Assurance Program Description	TR	Submitted: October 2022 Approved: May 2023
Applicability of Nuclear Regulatory Commission Regulations	TR	Submitted: December 2022 Approved: July 204
Fuel Qualification Methodology	TR	Submitted: February 2024 Approved: April 2025
Safeguards Information Protection Plan	Plan	Submitted: February 2023 Approved: March 2024
Event Sequence Identification and SSC Safety Classification Methodology	TR	Submitted: September 2023 Approved: March 2024
Micro Modular Reactor (MMR) Principal Design Criteria	TR	Submitted: November 2023 Approved: July 2024
Construction Permit Application	Application	Q1 CY26
Operating License Application	Application	Subsequent to issuance of the CP
Fuel Load/Operations	-	CY29

9 REFERENCES

[1] Dr. Susan A. Martinis to Ms. Andrea D. Veil, "Notice of Intent to Submit an Application for a Construction Permit for a Research & Test Reactor," University of Illinois to U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, May 19, 2021.

[2] "DRAFT Pre-application Engagement to Optimize Advanced Reactors Application Reviews," ML21145A106, May 2021.

[3] NUREG-1537, "Guidelines for Preparing and Reviewing Applications for the Licensing of a Non-Power Reactor" Part 1, Format and Content, February, 1996.

[4] Interim Staff Guidance Augmenting NUREG-1537, Part 1," ML12156A069, October, 2012

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Attachment 1

Acronyms and Abbreviations

CFR	Code of Federal Regulations
CP	Construction Permit
EIS	Environmental Impact Statement
FCM	Fully Ceramic Micro-Encapsulated (a registered trademark of Standard Nuclear, Inc)
FSAR	Final Safety Analysis Report
HALEU	High Assay Low Enriched Uranium
HIDRA	Hybrid Illinois Device for Research Applications
HTGR	High Temperature Gas-Cooled Reactor
IEMA	Illinois Emergency Management Agency
I&C	Instrumentation and Control
ISG	Interim Staff Guidance
MMR™	Micro Modular Reactor (a registered trademark of NANO Nuclear Energy Inc)
M&I	Maintenance and Inspection
NQA-1	American Society of Mechanical Engineers (ASME) QA Requirements for Nuclear Facility Applications
OR-SAGE	Oak Ridge Siting Analysis for power Generation Expansion
PSAR	Preliminary Safety Analysis Report
QA	Quality Assurance
QAPD	Quality Assurance Program Description
RAI	Requests for Additional Information
RCCS	Reactor Cavity Cooling System
RRI	USDOE Research Reactor Infrastructure Program
RTR	Research and Test Reactor
SSC	Structures, Systems and Components
TR	Topical Report
TRIGA	Training, Research, Isotopes, General Atomics (a registered trademark of General Atomics)
TRISO	TRIstructural ISOtropic
UCO	Uranium Oxycarbide
UIUC	University of Illinois Urbana-Champaign

V&V	Verification and Validation
USNRC	United States Nuclear Regulatory Commission
WP	White Paper