GDE-55115
Revision ID:1
Effective Date: 05/07/25

Guide

Project Number: 33470

DOME Scheduling Application

The INL is a U.S. Department of Energy National Laboratory
operated by Battelle Energy Alliance.

REVISION LOG

Rev.	Date	Affected Pages	Revision Description
0	04/17/24	All	See DCR 715127. New issue.
1	05/07/25	All	See DCR 717627. Revision.

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1. INTRODUCTION

This document describes how a reactor developer applies for time in the Demonstration of Microreactor Experiments (DOME) facility. It also describes how applications are evaluated to develop the annual and outyear DOME schedule.

The application process assumes that testing in DOME is funded by the applicant, and may be superseded by government-funded projects to accommodate government priorities.

2. APPLICATION INSTRUCTIONS

The application shall include a PDF file that is no more than 50 pages in length plus an attached master document and deliverable list (MDDL)which does not count towards the 50 page limit. The PDF file shall include completed versions of Table 1 and Table 2. Answers to the sections in Table 2 should include all assumptions made and provide the basis to support these assumptions.

Additionally, a separate schedule data native file (e.g., XER, MPP) shall be included in the application and does not count towards the page limit.

The notional yearly process is for NRIC to solicit applications in October and developers to submit applications in November. NRIC will notify developers of application results in April.

Each year following the initial application submittal, developers must confirm or update the milestone dates shown in Table 1 and provide an updated schedule file. In general, applicants need to notify NRIC immediately of any changes to Table 1 milestone dates. This helps the overall DOME schedule stay updated.

Extra consideration will be given for items in the MDDL which have already been formally delivered to INL.

Table 1. Applicant information.

Contact	
Company name	
Company address	
Point of contact and title	
Contact email and phone	
Technology	
Reactor name	
Reactor type	
Thermal power	
Fuel type and mass	
Coolant type(s) and inventories	
Power conversion method	
Proposed Milestone Dates	
Start of installation in DOME	
Start of testing in DOME	
End of testing in DOME	
End of removal from DOME (including interim storage plan)	

Table 2. Application sections.

Section		Description of Section Content
No.	Title	
1	Reactor Technology Maturity	Explanation of the reactor technology, including the key technology features of the reactor, design progression/maturity, the Technology Readiness Level (TRL) [ref. DOE G 413.3-4A] of critical technology elements, and the ongoing or planned activities to complete any technology maturation actions prior to entry into DOME. Summarize any technical risks and mitigation plans.
2	Fuel	Explanation of the plans to qualify, procure, deliver, store, and dispose of used fuel, including the plan for fueling and defueling the reactor.
3	Testing	Explanation of the reactor tests that are planned at DOME, including the test campaigns, test objectives, test durations, needed test equipment or capabilities, and operator training plans and operating plans (developed as necessary with INL). These plans should include details of expected interfaces and responsibilities throughout installation, operations, and decommissioning.
4	Project Schedule	Explanation of the schedule of activities from submission of the application through decommissioning, including the scope and duration of shut down, cooling, disconnection, removal, defueling, dispositioning and disposal activities (including plans for Post-Irradiation Examination (PIE) at INL, if applicable). The schedule should provide sufficient detail to demonstrate the applicant's understanding of the process for testing in DOME and fuel management. Applicants shall submit their schedule in the format and Work Breakdown Structure used in the attached Reactor Developer Schedule template, plus one additional level of detail to show activities that support major milestones.
5	DOME Integration	Explanation of how the reactor interfaces with DOME and any needs that are beyond the current capabilities of DOME (e.g., DOME modifications, specialized equipment or tools, new facilities, etc.).
6	DOE Authorization Plan	Explanation of the regulatory compliance plan and activities for obtaining DOE authorization for reactor startup in DOME, including regulatory requirements for nuclear safety, quality, and NEPA. INL will assist with this as necessary.
7	Funding	Explanation of the funding amounts and sources that have been secured to support activities from today through decommissioning, including any future funding that the applicant will need to secure. Applicant cost estimates for the same time period should also be provided. Any material change to the status of this information must be reported to NRIC/INL and DOE.

Section		Description of Section Content
No.	Title	
8	Experience and Capabilities	Explanation of the applicant's experience with similar projects, as well as the credentials of key personnel and management infrastructure (e.g., leadership, engineering design, quality assurance, procurement, project controls, etc.). In addition, describe any partnerships that will be leveraged, the nature of those partnerships, and the history of the parties successfully working together.
Attachment 1	Master Document and Deliverable List (MDDL)	The MDDL is a comprehensive, hierarchical catalog of all the documents and files related to the reactor experiment project at DOME. The MDDL includes information such as document number, revision, title, and maturity status (e.g., completion percentage). This serves as a central reference point, providing an overview of the project's documentation and helping team members find relevant and up-to-date information. Furthermore, the MDDL helps maintain organization, control, and versioning of documents.
Attachment 2	Project Schedule	See Section 4

3. APPLICATION EVALUATION

Applications will be scored as shown in Table 3. Applications that receive higher scores will have a greater chance of being scheduled in DOME near the requested timeline by the applicant. The risk associated with applicants meeting their proposed schedules will be assessed to ensure that DOME is utilized efficiently.

Table 3. Application score card.

Category	Characteristics of a Low Score	Characteristics of a High Score	Score
Reactor Technology Maturity Does the current technical maturity of the reactor present risks to the Applicant's schedule to enter the DOME?	The applicant's technology readiness plan is a high-level summary (e.g., tasks to resolve technical uncertainties or to increase TRL are not identified). There appear to be several key design or technology concerns that, if not successfully addressed, would threaten readiness for the DOME.	The applicant's technology readiness plan is detailed and comprehensive. There are no significant technology maturation issues that would threaten the Applicant's readiness for the DOME. Technical risks and mitigation plans are manageable.	(max of 15)
Fuel Is the plan to secure fuel at a sufficient maturity level to enable DOME deployment?	The applicant does not have a clear fuel source. Activities associated with sourcing and handling fuel have not been developed. The applicant's plan to secure and qualify fuel (to an appropriate level for a first-of-a-kind reactor in a DOE test facility) is a clear risk to DOME milestones.	The applicant has an available source to supply fuel with manageable levels of execution risk. The plan for fuel activities (e.g., procuring, fabricating, delivering, storing, assembling, loading, ownership of used fuel, etc.) has high likelihood of success.	(max of 15)
Testing Does the applicant's proposed test plan appear to present a risk to schedule or alignment with DOME's capabilities?	The applicant's test plans are a high-level summary and do not yet have sufficient detail to give confidence they will be well-aligned with the DOME's capabilities. Worse, some of the proposed test campaign's parameters would clearly exceed DOME capabilities or otherwise challenge DOME schedule commitments to future users.	The applicant's test plans are sufficiently developed and there is no reason to expect detailed procedures will threaten DOME readiness for the proposed project. There are no proposed test parameters that would challenge the DOME's capabilities or schedule commitments.	(max of 10)

Category	Characteristics of a Low Score	Characteristics of a High Score	Score
Project Schedule Does the applicant's proposed schedule have a high likelihood of meeting DOME's desired timeline?	Applicant's schedule is high-level; not all required workstreams are detailed; the durations of several workstreams have no obvious basis and/or appear to be unrealistic in duration; and there are numerous schedule risks. The applicant's baseline schedule shows significant negative float to key DOME milestones. Decommissioning activities are a high-level summary, or the timeline appears to be inconsistent with DOME timeline for subsequent testing. Some attributes that might indicate an immature schedule include: • Activities do not correspond to the WBS and MDDL. • Quantitative risk analysis of the schedule has not been performed or incorporated. • Monte Carlo analysis and quantified confidence level for timely completion not performed or incorporated.	Applicant's schedule is detailed, logic-driven, exhaustive of all workstreams, includes credible durations, and has manageable execution risks. There is margin between the applicant's delivery milestones and DOME's desired interface milestones. Decommissioning activities are sufficiently detailed, and the decommissioning timeline is consistent with the overall DOME timeline for subsequent testing (e.g., shut down, cool, disconnect, remove, decontaminate, etc.). Some attributes of a well-developed schedule might include: • Activities and their decomposition correspond to the WBS and MDDL. • Quantitative risk analysis with mitigations considered in schedule activities, durations, and reserve. • Monte Carlo analysis and quantified confidence level for timely completion.	(max of 10)
DOME Integration Are the applicant's technical interfaces well-aligned with DOME capabilities or are interfaces a risk?	The applicant has not yet detailed how their technology aligns with the DOME's interface requirements. Several of the interfaces will require significant effort by INL, or the applicant's part, to accommodate and may challenge the delivery schedule.	The applicant's understanding of the DOME's interface requirements is mature. There are no obvious challenges associated with delivering within those requirements.	(max of 10)

Category	Characteristics of a Low Score	Characteristics of a High Score	Score
DOE Authorization Plan Does the applicant demonstrate an understanding of the authorization process, have a robust plan to navigate it, and are there any obvious, significant authorization threats?	The authorization plan is light on details and is missing important features (e.g., safety, quality, and environmental, etc.). The safety-related features may present new phenomena that the regulator is unfamiliar with evaluating. At a screening level, there may be environmental impacts that could threaten NEPA timelines.	The authorization plan is well described with a clear understanding of the regulator's requirements and processes. The safety-related features of the technology are unlikely to present new hazards and phenomena that the regulator is unfamiliar with evaluating. At a screening level, the environmental impacts do not appear to be materially more challenging than other reactor technologies.	(max of 10)
Funding Is the applicant's funding sufficient to support their readiness for DOME utilization and to complete the test campaign and decommissioning? (See Note below)	Funding is insufficient or sources are undetermined. The applicant's funding is materially contingent on interim development outcomes that carry high risk.	The applicant's funding sources are secure and sufficient to execute the project through the end of testing and decommissioning. Funding is sufficient to cover the applicant's contingency for realized risk.	(max of 10)
Experience and Capabilities Does the applicant possess the suite of needed capabilities, experience, and network to be successful on the DOME's needed timeline?	The applicant has not demonstrated past performance in similar R&D efforts. The applicant is still standing up important parts of its execution infrastructure (e.g., leadership, QA, project management, design, supply chain, etc.). The relationship between the applicant and key supply chain partners is at an early stage.	The applicant has a demonstrated history of executing similar R&D projects. The applicant's internal processes are well established and time-tested. The applicant has a robust network of supply chain partners and has been collaboratively working with them to progress the technology manufacturing readiness.	(max of 10)

Category	Characteristics of a Low Score	Characteristics of a High Score	Score
Master Document and Deliverable List (MDDL) Does the applicant understand what documents and deliverables need to be developed to support the reactor experiment project at DOME?	The MDDL only identifies a small number of the documents, or provides category descriptions rather than specific items, that will ultimately be needed to support the reactor experiment project at DOME. The MDDL is not clearly organized.	The MDDL identifies most of the documents that will ultimately be needed to support the reactor experiment project at DOME. The MDDL is organized. The MDDL indicates specific information such as document number, revision, title, and maturity level.	(max of 10)

NOTE: *As DOE invests in critical infrastructure and funds critical and emerging technology areas, DOE also considers possible vectors of undue foreign influence in evaluating risk. As part of the research, technology, and economic security risk review, DOE may contact the applicant and/or proposed project team members for additional information to inform the review. This risk review is conducted separately from the technical merit review. If high risks are identified and cannot be sufficiently mitigated, DOE may elect to not schedule/fund the applicant.*