4. Project Abstract

Summary of Proposed Activity

The Southern Ohio Diversification Initiative (SODI) assembled a team to start the process of characterization, permitting, and decontamination and decommissioning (D&D) studies to support the deployment of advanced reactor technology at the Portsmouth Site in the 2028 to 2033 time-frame. SODI's proposed project meets the Funding Opportunity Announcement's objectives of: Completion of certification and licensing activities for advanced reactor designs—defined in this proposal as Generation IV reactors, non-light-water small modular reactors, and micro-reactors—and efforts involved in identifying, characterizing, permitting, and licensing sites associated with the proposed advanced reactor projects.

As the privately funded advanced reactor companies drive toward maturing their designs they face the problem of maintaining and growing private capital investment for their projects over the long period of time it takes to design, license, and build a reactor. Demonstrating progress, particularly in the licensing arena, offers the chance to demonstrate significant progress to stakeholders and future investors to meet the 2028 to 2033 goal. Prior to writing this proposal, the SODI team met with the majority of the advanced reactor community, the U.S. Department of Energy (DOE) Office of Environmental Management (EM), and the U.S. Nuclear Regulatory Commission (NRC), and has received positive feedback and support for this project.

Name of Applicant: Southern Ohio Diversification Initiative (SODI)

Project Title: Generic Design Support Activities for Advanced Reactors

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Orano Federal Services

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Idaho National Laboratory operated by Battelle Energy Alliance

PROGRAM
Pathway 2, Advanced Reactor Development Projects

Project Objectives

1. Consider the reuse of existing characterization data or existing licenses when submitting a license for a new reactor.
2. Develop an Early Site Permit (ESP) template for advanced reactors.
3. Consider the reuse of existing infrastructure and structures for a future reactor.
4. Develop a Plant Parameter Envelope (PPE) for use at the Portsmouth Site for advanced reactors.
    a. Review the current Nuclear Energy Institute (NEI) guidance for PPE development.
5. Consider the reuse of the Portsmouth Site for future deployment of advanced reactors.
6. Start the engagement with the NRC and industry for advanced reactors.
7. Update the Electric Power Research Institute's (EPRI) Siting Guide for advanced reactors.
8. Quantify the savings to DOE EM from future reuse of Portsmouth Site.

Project Description/Methods

This project will:

- **Update the EPRI Siting Guide for advanced reactors.** The team members, led by EPRI, will engage advanced reactor companies to seek input to review and modify the siting guide.
- **Develop a PPE.** The SODI team will review the current NEI guidance for PPE development to evaluate and make recommendations for advanced reactor technologies.
- **Use existing data and NRC licenses.** The SODI team will evaluate available data for potential reuse.
- **Develop an ESP template.** The SODI team will create an Advanced Reactor ESP template by referencing the EPRI Light Water Reactor ESP template.
- **Reuse of existing infrastructure and structures.** The SODI team will review DOE EM's D&D documents for the Portsmouth Site and based on modern advanced D&D methods, identify potential infrastructure, structures or building foundations that could be reused for a future reactor.

Project Deliverables

The following are major deliverables for the proposed scope of work:

- Infrastructure reuse paper (first draft)
- D&D review paper (first draft)
- Development of PPE based on review of NEI PPE document
- Infrastructure utilization assessment (final report)
- D&D review paper (final report)
- ESP template
- Quarterly progress reports
- Final project report
- Insight for and revisions to the EPRI Siting Guide

Potential Impact/Benefit/ Outcome

Efficient siting and licensing is essential to cost effective deployment of advanced reactor designs in the U.S. The NRC, in 10CFR52 Early Siting Permit, has identified site specific licensing that can be completed prior to a final design. The template to be developed in this project allows future licensees to advance their licensing efforts at DOE sites at reduced cost. The template adds early regulatory certainty to advanced reactor projects and provides a road map for leveraging existing site licensing data. The EPRI Siting Guide will also be updated to include advanced reactor designs.

In addition to creating a template which can be used for other sites, focusing on the Portsmouth Site which is currently undergoing D&D activities, will allow the SODI team to provide to the DOE a white paper identifying potential infrastructure that could be reused. The reuse of the Portsmouth Site supports DOE EM's mission of accelerated cleanup and closure, and also saves taxpayer dollars.

Major Participants

The SODI team includes EPRI, Southern Nuclear Development LLC, Orano Federal Services, Orano Decommissioning Services, and Idaho National Laboratory operated by Battelle Energy Alliance. The SODI team has discussed the project with the NEI and EPRI who arranged meetings with companies pursuing advanced reactor designs. Many of these vendors have provided letters of support to SODI for this project.