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Resource Team Annual Report FY23

August 2023

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Changing the World's Energy Future

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NRIC Resource Team FY-23 Annual Report

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REVISION LOG

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0	08/18/2023	All	New issue.

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NRIC Resource Team FY-23 Annual Report

1. INTRODUCTION

The National Reactor Innovation Center (NRIC) Resource Team's (NRT) mission is to support the further development of qualified nuclear demonstration projects by providing limited direct-funded technical and project planning support to reactor designers. The NRT mission aligns with NRIC's mission to accelerate the commercialization of new reactor concepts and technologies, advancing the U.S.'s nuclear leadership.

The NRT program was developed in 2020 to provide reactor designers equal opportunity to engage with participating laboratory subject-matter experts (SMEs) and technologies. Approved projects demonstrate sufficient commitment and progress, as well as reasonable assurance that the team, partners, and affiliates will meet export control requirements. The initial NRIC Resource Team established resources at Idaho National Laboratory (INL), Argonne National Laboratory (ANL), Pacific Northwest National Laboratory (PNNL), and Oak Ridge National Laboratory (ORNL) to expand reactor designers' access.

It was decided that fiscal year 2023 (FY-23) will be the final year of the NRT program. NRIC is thankful to all participants who utilized NRTs.

1.1 Objective

This report documents the accomplishments, progress, and forecasted activities as of September of FY-23.

NRT continued to connect with reactor developers while working toward a smooth program closeout at the end of FY-23.

2. PROGRESS

2.1 Connecting with Reactor Developers

During the last months of FY-22 and the early months of FY-23, the NRT program reached out to potential demonstration reactor developers through lab points of contact, webcasts, and other laboratory publications to publicize the NRT and its potential to provide access to laboratory SMEs.

Additionally, NRIC utilized its connections within the National Laboratory structure such as INL, ANL, PNNL, and ORNL to spread the word about NRT resources being available to reactor developers.

2.1.1 Program growth

In FY-21, NRT worked with lab SMEs to develop a standardized technical agreement and a Statement of Work (SOW) template for NRIC, which facilitated a quicker, more efficient startup process for qualified applicants.

In FY-22, NRT expanded on the application process to better review potential conflicts of funding, engaged additional resources at PNNL and ANL to decentralize NRTs within the laboratory complex, and increased the total number of NRTs by 50%.

In FY-23, the NRT saw its greatest number of applicants in a single FY, which led to program oversubscription and re-evaluation. Near the beginning of FY-23, five early applicants for NRTs were awarded with available funding under the Continuing Resolution that determined programmatic funding levels at that time. Throughout FY-23, internal discussions were held in NRIC with the Department of Energy (DOE) about the future of the NRT program. To align with the maturation of the nuclear industry, it was decided that NRIC will end the NRT program after FY-23 and focus resources on the infrastructure, plans, and processes needed to support reactor demonstration.

2.1.2 National Reactor Innovation Center Resource Team Achievements

- Five advanced reactor developer projects applied and qualified to work with the NRT program in FY-23.
    - *Radiant* – Kaleidos Reactor Design Support
    - *Westinghouse* – Lead Fast Reactor (LFR) Development
    - *Terrestrial Energy* – Integral Molten Salt Reactor Alloy Development
    - *Flibe Energy* – Sodium Chloride Integral Fast Reactor Salt Properties
    - *X-Energy* – Reactor Siting Risk Assessment

Project	Lab – Scope of support
Radiant	INL – Siting support: site use permit, National Environmental Policy Act (NEPA) support, proposal review INL – Design support: tristructural isotropic (TRISO) fuel consultation, cladding and reactor materials review, ASME material qualification support, multiphysics modeling INL – Quality system review and support
Westinghouse LFR	ANL – Uncertainty quantification approach ANL – Passive heat removal system review ANL – Optical measurement development consultation ANL – Refueling strategy consultation ANL – Gas capture system review ORNL – Material performance consultation
Terrestrial Energy	INL – Alloy qualification plan review INL – Roadmap for required alloy analysis activities
Flibe Energy	INL – Salt fabrication INL – Non-rad salt property measurements

Project	Lab – Scope of support
X-Energy	PNNL – Reactor siting risk study PNNL – White paper report on siting hazards

3. Closing Statement

The NRT program evolved from an initial effort to support DOE Advanced Reactor Development Program (ARDP) applicants in interfacing with the National Laboratories on potential work scopes. The formal Resource Team program, started in 2020, aimed at advanced nuclear development support through public/private partnerships and leveraging of National Laboratory resources. Over its 3-year lifetime, the NRT program funded 27 successful projects utilizing six National Laboratories. In NRIC, we are proud of what has been achieved and thankful to all our industry partners who utilized this program.

Though the NRT program is ending, the efforts and outcomes of this program will continue to benefit the development of advanced nuclear reactors.