Defense Nuclear Nonproliferation’s Enabling Capabilities in Technology (TecH) Consortium

Data sharing and preservation

Data management plans should describe whether and how data generated in the course of the proposed research will be shared and preserved and, at a minimum, describe how data sharing and preservation will enable validation of results, or how results could be validated if data are not shared or preserved.

The PI, all co-PIs, and all project personnel (postdocs, students, staff) will be responsible for data management. Data will be generated at each of the partner institutions. During the course of active research, data will be hosted by the generating institution, with primary and back-up storage locations that meet data security requirements. Data will be evaluated prior to release to ensure an appropriate repository is selected with respect to CUI status and data type. National lab partners will be consulted with respect to release of data as applicable.

When the data are ready for release, data will be archived using available federal resources. Public/open data will be archived using DOE OSTI. We will work with our national lab partners and sponsor to identify and appropriately archive any CUI data following applicable procedures and using available resources (e.g., Project Alexandria if available). Other existing appropriate and approved databases and repositories will also be considered, as needed.

A consortium-wide GitHub repository will be established to host code and analysis frameworks.

Data used in publications

Data management plans should provide a plan for making all research data displayed in publications resulting from the proposed research open, machine-readable, and digitally accessible to the public at the time of publication. This includes data that are displayed in charts, figures, images, etc. In addition, the underlying digital research data used to generate the displayed data should be made as accessible as possible to the public in accordance with the Principles published in the DOE Policy for Digital Research Data Management. The published article should indicate how these data can be accessed.

In line with DOE's Public Access Plan, publicly releasable research findings and data will be published openly. The most effective and reliable means of dissemination of research findings are peer-reviewed publications (both journal and conference) and MSc and Ph.D. theses, which will comprise the majority of the consortium's generated information. Raw data measurements or preprocessed data, as applicable, used to inform these studies will be archived and shared on OSTI or other appropriate repositories. When possible, a data availability statement with a direct link to the available data (or a description of where to find the data if linking is not available) will be provided in any publications. All data will be accompanied by documentation to ensure usability for future work. In addition, descriptors for datasets of especially high value to the community will be published in peer reviewed data journals, such as Nature Scientific Data.

We will encourage the sharing of pre-press, non copyrighted versions of peer reviewed publications on OSTI and will follow all application requirements regarding submission of publications to OSTI by laboratory personnel and consortium members.

Data management resources

Data management plans should consult and reference available information about data management resources to be used in the course of the proposed research. In particular, DMPs that explicitly or implicitly commit data management resources at a facility beyond what is conventionally made available to approved users should be accompanied by written approval from that facility. In

determining the resources available for data management at DOE Scientific User Facilities, researchers should consult the published description of data management resources and practices at that facility and reference it in the DMP.

We will make use of government-sponsored data management resources (e.g., OSTI, Project Alexandria). Intermediate data storage will be handled at generating institutions with data saved in two or more locations to provide redundancy until data can be released to an archival repository. For data involving partner DOE national laboratories, the lab's policies and procedures for data management will be strictly followed.

Throughout the performance period, software used in the processing of raw and production-quality data will be stored on hard drives and/or in software development and management platforms with version control systems, such as GitHub, Bitbucket, Gitlab, etc. These platforms enable private access to software during development with options for locally-hosted servers for the protection of U.S. national, homeland, and economic security. Additionally, options for conversion of repositories to public access are available once software has been approved by DOE for release. Software will also be distributed via DOE CODE (https://www.osti.gov/doecode/policy), as appropriate.

Confidentiality, security and rights

Data management plans must protect confidentiality, personal privacy, Personally Identifiable Information and U.S. national, homeland, and economic security; recognize propriety interests, business confidential information, and intellectual property rights; avoid significant negative impact on innovation and U.S. competitiveness; and otherwise be consistent with all applicable laws, regulations, agreement terms and conditions, and DOE orders and policies.

No personally identifiable information (PII) is included in any raw research data collection. No data analysis requires the use of PII. No PII should enter into either the data collection or the data backup and therefore should eliminate the possibility of PII being released if requests are made for raw or analyzed data.

Demographic information will be protected appropriately. In accordance with UTK policy, disaggregated information at UTK will be stored on Google Drive or MS OneDrive that is only accessible to the consortium leadership team. For PII stored at other consortium instititutions, the data will be stored according to that institution's PII data management policies. It is anticipated that demographic information will be largely reported in aggregate across the consortium and will not include PII. We recognize that non-PII can become PII whenever additional information is made publicly available - in any medium and from any source - that, when combined with other available information, could be used to identify an individual.

We recognize and will abide by the *Rights in Technical Data* specified in the FOA:

- Normally, the government has unlimited rights in technical data created under a DOE/NNSA agreement. Delivery or third-party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE's own needs or to ensure the commercialization of technology developed under a DOE agreement.

Any data generated that falls into CUI or higher classification will be handled appropriately at the generating institution and archived following appropriate and applicable laws, regulations, and government-wide policies to ensure access limitations are maintained to support U.S. national security.

Planned Research Outputs

Physical object - "Hardware devices"

In situ electrochemical/optical spectroscopy tracking system

Microfluidic alpha spectrometer

Dataset - "Data sets"

Nuclear-induced aerosol dataset

Reference materials for single particle uranium oxide

Morphological images of hydroloysis products from uranium fluorides

Model representation - "System and process models"

integrated fate and transport modeling

digital twins of MSR, PBR, and relevant testbeds (e.g., USTC, BEARTOOTH, ASET)

Workflow - "Nuclear separations techniques"

Separations method for trace Np detection

Workflow - "Data analysis algorithms"

Analysis methods for ingesting disparate data sources

Uncertainty quantification approaches

Planned research output details

Title	Type	Anticipated release date	Initial access level	Intended repository(ies)	Anticipated file size	License	Metadata standard(s)	May contain sensitive data?	May contain PII?
Hardware devices	Physical object	Unspecified	Open	None specified		None specified	None specified	No	No
Data sets	Dataset	Unspecified	Open	None specified		None specified	None specified	No	No
System and process models	Model representation	Unspecified	Open	None specified		None specified	None specified	No	No
Nuclear separations techniques	Workflow	Unspecified	Open	None specified		None specified	None specified	No	No
Data analysis algorithms	Workflow	Unspecified	Open	None specified		None specified	None specified	No	No