ARC/NDA Sponsored Call for Proposals for NNL Facility Access

1. Introduction

NNL, NDA and the ARC (**Alpha Resilience and Capability)** consortium are working together to provide an opportunity for academics to access NNL’s active facilities. This is a two-part process:

* Phase 1: FY24/25 – visit to NNL’s active facilities to discuss potential R&D projects with NNL’s subject matter experts and develop funding applications for Phase 2
* Phase 2: FY25/26 – Joint delivery of approved experimental programmes by the successful academics and NNL scientists

As the research will be funded by the NDA and the ARC consortium, research topics must be aligned with either the NDA mission or the ARC mission (or both). This document provides more information on Phase 1 only.

1. Academic User Access FY24/25 and FY 25/26
	1. Phase 1 (FY24/25)

National Nuclear Laboratory Limited (“NNL”) would like to invite university academics and students to develop research proposals aligned with the **Alpha Resilience and Capability’s (ARC)** and/or the **Nuclear Decommissioning Authority’s (NDA)** missions that could benefit from access to NNL facilities.

This call provides an opportunity for applicants to visit NNL’s facilities, engage with NNL’s Subject Matter Experts (SMEs) and identify potential research projects and materials. Applicants will need to submit an outline proposal for experimental access in FY 25/26. It is anticipated that the site visits will be very beneficial in terms of helping applicants to firm up on proposal details (e.g. in terms of understanding access to active materials and ensuring research aims for Phase 2 are realistic). Following the visit, applicants will be supported by NNL to develop detailed and viable experimental proposals ready for Phase 2 submission.

* 1. Phase 2 (FY25/26)

In early FY25/26, NNL will hold a follow up call. It will then be possible to submit proposals developed during Phase 1 to a panel which includes the call funders (NDA, ARC, NNL), who will decide which proposals should be taken forward. Phase 2 research may involve “hands-on” access, “hands-in-pockets” access or “remote” access:

* “Hands-on” access – User is present on site and performs hands-on work at the NNL facility
* “Hands-in-Pockets” – User does not perform the work but is present on site to view the work and to offer advice and direction within the scope of the permissioned work pack
* “Remote” – The work is performed by NNL. The user has no physical access to NNL’s facilities, although close contact is maintained to provide opportunities for input
	1. Phase 1 – Timescales

The call for Phase 1 is open from 16th August – 27th September 2024 for visits performed in the period December 2024 to March 2025.

Please note that Call Schedule dates are all subject to the condition that any planned access must be possible within any Government imposed restrictions on work or travel, any imposed restrictions by the Site licensor and within any operating procedures put in place by NNL to ensure the continued safety, security and health of our workforce and any other visitors to our facilities.

* 1. Facilities and Equipment

The facilities and equipment available to visit during Phase 1 are detailed on pages 45 - 69 of the NIRO UK Nuclear Fission R&D Catalogue[[1]](#endnote-1) and both the NNUF[[2]](#endnote-2) and Royce[[3]](#endnote-3) websites. NNL contact names and details are included within the R&D Catalogue and stated on the websites. This Phase 1 call will cover all access costs that are not already covered by existing funding available to the academic (see Notes for Clarification, section 4.5).

* 1. Research Materials & Samples

NNL are custodians of irradiated and nuclear materials that may be of interest to the researcher for experimental work in Phase 2. For more information, please contact the access.liaison@uknnl.com inbox. Alternatively, academics may wish to arrange shipment of their own materials to NNL for Phase 2 research.

1. Call Sponsors

This call is sponsored by the ARC and NDA, with additional funding and support provided by NNL.

* 1. National Nuclear Laboratory

The National Nuclear Laboratory (NNL) is a UK government owned and operated nuclear services technology provider covering the whole of the nuclear fuel cycle. Established in 2008, NNL brought together the UK’s nuclear research and development capability into one organisation. Our workforce represents a combined 10,000 years of expertise in nuclear science and technology. We are pioneers, innovators and experts in our field. We work globally at the forefront of nuclear science, providing knowledge, technology and access to cutting-edge facilities to partners and customers.

NNL facilitates academic research on irradiated and nuclear materials. We provide equipment, facilities and associated expertise to process and analyse materials, particularly those that are too radioactive for university laboratories including materials that can only be handled on nuclear licensed sites.

NNL is committed to facilitating access to our unique facilities and equipment. As a national laboratory we strive to deliver world leading science in the UK and collaboration with university partners is critical to this mission. The call process is a tested approach to enhance and streamline user access to relevant equipment and facilities at NNL. This year, taking the learning from previous calls, the process has been split into two, with this part (Phase 1) comprising a visit, to allow a fully detailed proposal to be produced for future submission (Phase 2). The NNL User Access Team provides a single point of entry into NNL facilities (access.liaison@uknnl.com).

This user access call provides academics with an opportunity to apply for access primarily to our active laboratories and SMEs on the Sellafield (Cumbria) and Westinghouse (Preston) sites.

* 1. The Nuclear Decommissioning Authority

The NDA’s mission to clean up the UK’s civil nuclear legacy will take over a hundred years to complete. NDA maintains a programme of high-level academic research to ensure that we have a national capability with sufficient and appropriate skills to be the future technical leaders in the decommissioning field. Over the last decade, we have sponsored >100 PhD and postdoctoral research projects at UK universities with the majority of our students taking up employment that contributes directly to nuclear decommissioning upon completion of their studies.

Whilst many academic researchers get some experience of working with radioactive sources or radiation generating equipment as part of their studies, working with active materials on nuclear sites is a unique challenge. Gaining first-hand experience of this challenge is very helpful in developing a researcher’s skill set to increase their employability and to prepare them for a career of working in or with the nuclear decommissioning industry.

To make this experience more accessible, the NDA are offering financial support to UK academic researchers who would like to access the UK National Nuclear Laboratory’s active**\*** facilities. The visit (Phase 1) will allow the researcher to identify archived material, before having the opportunity to propose practical research (Phase 2), relevant to the NDA’s mission, on our nuclear licensed sites. The NDA Strategy[[4]](#endnote-4) sets out our remit and overall approach to decommissioning the civil nuclear legacy, and documents such as our 5-year Research and Development plan[[5]](#endnote-5) and Mission Progress Report[[6]](#endnote-6) add detail to our challenge areas.

Researchers applying for this support do not have to be directly funded by NDA or one of our subsidiaries but must be UK based and be able to demonstrate the relevance of the proposed active**\*** work to the NDA’s mission.

* 1. Alpha Resilience and Capability

The UK ARC Programme[[7]](#endnote-7) is a collaboration across the civil and defence nuclear sector involving Site Licence Operators, government bodies, Regulators and national laboratories set up for the purpose of sustaining and enhancing our world leading alpha capabilities to prepare the UK nuclear industry to enact critical national programmes. ARC enables collaboration to identify cross sector interventions with objectives to:

* De-risk current UK alpha programmes and build resilience and defence in depth.
* Build the capability and capacity to launch future programmes.
* Help the UK maintain its power base as a global leader for complex alpha programmes.

A key part of the programme is the attraction and development of high-level qualified new talent in the sector to ensure sustainability of Subject Matter Expertise/Technical Leadership; with PhD qualified people being an important aspect of the talent pipeline.

ARC are offering financial support to UK academic researchers who would like to access the UK National Nuclear Laboratory’s alpha active**\*** facilities. To receive full or part funding from ARC, the proposal must include aspects of actinide and/or plutonium science. The visit (phase 1) will allow the researcher to identify archived material, before having the opportunity to propose practical research (phase 2), relevant to ARC’s mission[[8]](#endnote-8).

Researchers applying for this support do not have to be directly funded by ARC or one of our subsidiaries but must be UK based and be able to demonstrate the relevance of the proposed alpha active**\*** work to ARC’s mission.

\*Access to non-active equipment and facilities, including the NNUF Hot Robotics Facility at Workington, will be considered if it is an essential pre-cursor to future active work.

1. Call Details
	1. Eligibility

Applicants must be from a UK University. Their proposed active\* research activity must be relevant to:

1. The NDA’s mission. For example, proposals that focus on future reactor fuel development or fusion components would not be eligible – if in doubt, please contact rick.short@nda.gov.uk or ed.j.butcher@uknnl.com to discuss.

And/or

1. The ARC’s mission. To receive full or part funding from ARC, the proposal must include aspects of actinide and/or plutonium science. Please contactmichael.froggatt@uknnl.com or edward.reeves@uknnl.com for further information.

**NOTE I**: All NNL facility access requests in FY 24/25 from current NDA bursary or ARC supported PhD programme projects must apply via proposals to this Call.
**NOTE II**: The proposed Phase 1 access and discussions with NNL’s SMEs (to enable subsequent submission of a detailed Phase 2 proposal) must be completed no later than the end of March 2025.
**NOTE III**: Primarily, this call covers access to active**\*** facilities and equipment.
**NOTE IV:** Projects that are out of scope of (1) and (2) can seek access to NNL through other mechanisms, please contact access.liaison@uknnl.com if this applies.

However:

\*Access to non-active equipment and facilities, including the NNUF Hot Robotics Facility at Workington, will be considered if it is an essential pre-cursor to future active work.

* 1. Available Equipment

This Phase 1 call provides an opportunity to visit NNL facilities and see NNL’s equipment and capabilities as detailed on pages 45-69 of the UK Fission R&D Cataloguei and both NNUFii and Royceiii websites. NNL’s SMEs will support development of research proposals and, where possible, provide access to information on materials of potential research interest.

* 1. Security Clearance Requirements

Successful applicants for Phase 1 will conduct a ‘Hands in Pockets’ visit to the NNL facility. In this mode of access, it will be possible to see equipment and it may be possible view specific samples, but no hands-on research will be performed.

This mode of access requires you to undergo **security clecks. This takes time so the formal process must be started as soon as successful applications are identified**.

* Stage 1: BPSS (Baseline Personnel Security Standard). This involves a criminal record check, an ID check (to verify your identity, nationality and proof of address), a right to work check (to confirm a person's legal right to work status), and a 3-year employment history check.
* Stage 2: SC (security check). Pre-requisites: BPSS and a minimum of 5 years UK residency. This includes completion of a security questionnaire, a departmental/ company records checks and financial checks. Further clarification may be sought from third parties included on the security questionnaire.

For more details see <https://www.gov.uk/government/publications/united-kingdom-security-vetting-clearance-levels/national-security-vetting-clearance-levels>.

* 1. Call Application Process

To be considered, academics are required to submit a proposal outlining their proposed visit and the expected benefit to the research and researcher, using the template provided in this document. All submissions will be assessed by a panel of the call funders including ARC, the NDA and NNL. Feedback will be provided for all submissions, whether successful or not.

Proposals will be assessed by the panel based on the “Assessment Criteria” provided below.

Successful applicants will be notified by NNL and will be asked to enter into an agreement with NNL and the funding partners, setting out the terms relating to such access to the facilities i.e. behaviours, confidentiality, IP, costs (“the Agreement”) etc. Successful applicants will then work closely with NNL to prepare for the visit and undergo relevant training and security clearance (where necessary under the relevant site licence).

Scheduling of the visit and the SME time will be agreed by the NNL User Access leader with the academic.

* 1. Notes for clarification

Costs associated with the visit will be covered by the FY24/25 call. Details of the Agreement will be made available to the successful applicants. However, for guidance these costs could include:

* security clearance
* drugs and alcohol testing
* training courses
* NNL support in the translation of the experimental requirements and preparation of a detailed proposal for the future work/experiment.
* support completing the required access forms
* NNL operator to perform retrieval and examination of samples of interest (if feasible)
* NNL technical staff and SME to provide detailed advice
* NNL supervision
* travel expenses
* accommodation

**The call will not cover** any form of salary or payment for the visit for the academic partners. **This call (Phase 1) will not cover** any R&D. See section 5.3 for completion.

* 1. Schedule

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| **Date** | **Activity** | **Notes** |
| **16th August 2024** | Call opens | Briefing webinar will be held on **September 2nd.**Register your interest at access.liaison@uknnl.com |
| **August – September 2024** | Proposal preparation period for academics | Dialogue between the academic, the NNL Lead Equipment Scientist and the User Access Lead to assess the value and test the technical and operational feasibility of the proposal |
| **27th September 2024 (23:59)** | Call Closes |  |
| **23rd September – 4th October 2024** | Internal costings of proposals.Proposals sent to the funding partners for internal review. |  |
| **7th – 11th October 2024** | Panel Assessment of the proposals | A panel review of all proposals. |
| **14th – 18th October 2024** | Notification of the Panel decisions | Applicants will be notified of the Panel’s decisions. Feedback will follow.Successful applicants will receive contract paperwork that includes additional details to be completed by the applicant. |
| **October – February 2024** | Security Clearance Process | This is a rate limiting step for access (average of 4-6 weeks for non-active and Preston Lab; 3 months for areas of Central and Windscale Labs) so must be initiated for successful applicants immediately. NNL will advise successful applicants of the requirements. |
|  | Preparation and planning for access | This will require further discussion between NNL and successful applicants. |
| **December 2024 – March 2025** | Access |  |
| **December 2024 – March 2025** | Academic Partners to: (1) Produce Phase 2 proposals and (2) produce a case study detailing the benefit of the visit to the academic and their research | Academic partners work with NNL SMEs to produce a detailed experimental proposal, ready for funding application. |
| **April 2025 onwards** | Phase 2 | It is NNL’s intention to hold a follow up call (Phase 2) that would allow the successful experimental proposals generated in this phase, to be taken forwards for access in FY25/26. |

1. Phase 1 proposal Submission – Academic User Access FY 24/25 Call
	1. Applicant Details & Phase 1 Proposal

This section is to be completed by the applicant with assistance from the NNL technical team. For any further information or clarification, please contact the access.liaison@uknnl.com inbox.

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| ***APPLICANT DETAILS*** |
| *Applicant details. To be completed by the applicant with assistance from the NNL technical team* | *Title* |  |
| *Full Name(s)* | *Please provide the full names of all supervisors/academics/students expected to attend the visit.* |
| *Institution* | *Only UK universities are eligible* |
| *Email Contact Address(es)* | *Please provide the email contact address of all supervisors/academics/students expected to attend the visit.* |
| *Phone number(s)* | *Please provide the phone number of all supervisors/academics/students expected to attend the visit.* |
| *Contact Postal Address(es)* | *Please provide the contact address of all supervisors/academics/students expected to attend the visit* |
| *Title of the research project to which this active proposal relates* | *It is anticipated that most proposals will form part of an ongoing PhD or PDRA research project* |
| *Funding providers for the above research project* | *e.g. University, EPSRC, Industry, Nuclear Site Licence Company, NDA, ARC, Regulators. If industry, please provide contact details for the industry sponsor* |
| *Progress to date for the above research project* | *e.g. 50% of PhD project completed to date* |
| *University Contract’s Office contact for this proposal* | *Name and email address of the University Contract’s Office contact with whom the Call and associated contract requirements including turnaround timescales have been discussed.* |
| *NNL contact(s) for this proposal* | *Name and email address of the NNL technical lead with whom the active facilities proposal has been discussed/ developed* |
| ***PHASE 1 PROPOSAL DETAILS*** |
| **Phase 1 Scope** | *Which NNL facility would you like to visit?* | *NNL has four world-leading laboratories in the North West of England. The equipment available at NNL’s facilities are detailed on pages 45-69 of the NIRO UK Nuclear Fission R&D Cataloguei and both NNUFii and Royceiii websites. The below are examples and not an exhaustive list of the capabilities at each facility, please contact the* *access.liaison@uknnl.com* *inbox for further information.**Workington – non-active facility, rig-hall* *Windscale – In-cave (hot cell), PIE**Preston – Nuclear physics and advanced reactors; uranium fuels; analytics services and process chemistry**Central – Glovebox; electron microscopy; other active work* |
| *What equipment do you need to see?* | *The equipment available at NNL’s facilities are detailed on pages 45-69 of the NIRO UK Nuclear Fission R&D Cataloguei and both NNUFii and Royceiii websites.* |
| *Which SMEs do you need to talk to during Phase 1?* | *Name and email address of the NNL SME(s) with whom the detailed experimental proposal for Phase 2 will be discussed/developed.* |
| *Are you interested in any material from NNL’s sample archive?*  |  |
| *How will the applicant benefit from a visit to NNL facilities?* | *Expected value from access to NNL.* |
| *How will the research benefit from a visit to NNL facilities?* | *Expected value from access to NNL.* |
| **Outline of Phase 2 Scope** | *Outline proposal for work to be undertaken in Phase 2* | *Please note, Phase 1 will allow researchers to visit NNL’s facilities and discuss potential R&D projects with NNL’s SMEs to develop funding applications for Phase 2. We are not expecting a detailed experimental research proposal at this stage. This section is to provide a potential scope of work to be undertaken in Phase 2 and should be a high level suitable for a general audience (max 500 words).* |
| *How does your outlined scope of work align with NDA and/or ARC missions?* | *As the research will be funded by the NDA and the ARC consortium, research topics must be aligned with either the NDA mission or the ARC mission (or both).* |
| *What other information will you need to develop a detailed experimental research proposal?* |  |

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| **ASSESSED CRITERIA** |
| Phase 1 Scope | This category will count for 40% of the overall score in the assessment process. See Assessment Criteria category Phase 1 Scope below for guidance on how to complete this section. |
| Phase 2 Scope – Relevance to the ARC and/or NDA mission | This category will count for 60% of the overall score in the assessment process. See Assessment Criteria category Phase 2 Scope - Relevance to the ARC and/or NDA mission below for guidance on how to complete this section |
| **ASSESSMENT CRITERIA** |
| See below | NOTE: Primarily, this call covers access to active\* facilities and samples. However: \*access to non-active facilities will be considered if it is an essential pre-cursor to future active work. |

* 1. Assessment Criteria

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| **Category** | **Ideal response will…** | **Assessment criteria** |
| **Phase 1 Scope**40% of available score | • Provide the researcher with some experience of being on a nuclear licensed site.• Familiarise the researcher with NNL’s facilities and equipment.• Specify any necessary inspection of sample records, technical reports and/or archived material (if feasible) to be undertaken during the visit.• Explain how the visit will be used to develop a detailed experimental proposal.• Detail a clear benefit to the researcher.• Detail a clear benefit to the research. | **(0) No Evidence or very poor**• The Scope does not involve or benefit from a visit to NNL facilities.**(1) Poor**• The Scope includes a ‘hands in pockets’ visit to a non-active NNL facility as a necessary pre-cursor to future active work.**(2) Acceptable** •The Scope includes a ‘hands in pockets’ visit to an NNL facility on a nuclear licensed site to see the facility and equipment and to discuss projects with SMEs in order to write a detailed experimental proposal for future active work. The proposal does not detail a clear benefit to the researcher.**(3) Good**• The Scope includes a ‘hands in pockets’ visit to an NNL facility on a nuclear licensed site to see the facility and equipment and to discuss projects with SMEs in order to write a detailed experimental proposal for future active work. The proposal details a clear benefit to the researcher.**(4) Excellent**• The Scope includes a ‘hands in pockets’ visit to an NNL facility on a nuclear licensed site to see the facility and equipment and to discuss projects with SMEs in order to write a detailed experimental proposal for future active work. In addition, the work requires the retrieval of samples, sample records and/or technical reports for inspection. The proposal details a clear benefit to the researcher and the research. |
|  |  |  |
| **Phase 2 Scope - Relevance to the ARC and/or** [**NDA mission**](https://www.gov.uk/government/publications/nuclear-decommissioning-authority-mission-progress-report-2021) **and associated** [**strategy**](https://www.gov.uk/government/publications/nuclear-decommissioning-authority-strategy-effective-from-march-2021)60% of available score | • Refer to specific challenges on ARC and or NDA sites that exist now or are likely to become issues in the future with examples from one or more ARC and or NDA sites.• The response will describe the gap in the current understanding/knowledge base that the work will address and demonstrate understanding of the challenge and the sites/process/technologies it relates to.• Describe how the proposed research relates to those problems and will tackle them increase understanding of them/contribute to or produce an alternative tool or technique for dealing with them.• Describe how the work is novel and/or builds upon previous work or experience of the applicants(s).Applicants who have not previously worked with the ARC and or the NDA or with partners supporting the NDA mission are advised to seek support from industry experts to help complete this section. | **(0) No Evidence or very poor**• Response does not answer the specific question or provides no detail of how the active work relates to the ARC and/or [NDA’s mission](https://www.gov.uk/government/publications/nuclear-decommissioning-authority-mission-progress-report-2021) and associated [strategy](https://www.gov.uk/government/publications/nuclear-decommissioning-authority-strategy-effective-from-march-2021).**(1) Poor**• The response does not clarify how this proposal is relevant to the ARC and/or [NDA’s mission](https://www.gov.uk/government/publications/nuclear-decommissioning-authority-mission-progress-report-2021) and associated [strategy](https://www.gov.uk/government/publications/nuclear-decommissioning-authority-strategy-effective-from-march-2021).• The objectives are not stated or are unclear.• The response is unclear with respect to the methodology that is to be employed and/or is unclear as to how the response builds on prior research.**(2) Acceptable**• The objectives of the project have been defined.• The response provides an explanation of how this is relevant to the ARC and or NDA’s mission and associated [strategy](https://www.gov.uk/government/publications/nuclear-decommissioning-authority-strategy-effective-from-march-2021), but may lack specific examples of where knowledge gained could be applied in support of an ARC and/or [NDA strategic outcome](https://www.gov.uk/government/publications/nuclear-decommissioning-authority-mission-progress-report-2021).• The response describes the methodology to be employed but may lack detail on why that methodology is appropriate and/or be unclear as to how the response builds on prior research.**(3) Good**• The proposed active research shows a clear link with a problem statement or challenge supporting a [strategic](https://www.gov.uk/government/publications/nuclear-decommissioning-authority-strategy-effective-from-march-2021) outcome within the ARC and/or [NDA’s mission](https://www.gov.uk/government/publications/nuclear-decommissioning-authority-mission-progress-report-2021), building on prior research where appropriate.• The response provides some supporting evidence of how the research meets the challenge and/or includes credible examples of where the research could be applicable across the ARC and/or NDA group.**(4) Excellent**• The proposed research topic shows a strong connection with the ARC and/or [NDA strategy](https://www.gov.uk/government/publications/nuclear-decommissioning-authority-strategy-effective-from-march-2021) and an existing or future research challenge as well as an ARC and/or [NDA strategic outcome](https://www.gov.uk/government/publications/nuclear-decommissioning-authority-mission-progress-report-2021). The proposed research shows insight into the decommissioning challenge that goes beyond that purely communicated in published materials from ARC and/or NDA.• The response makes clear the link to prior research, so the technical credibility of the research is soundly established.• The benefits of undertaking the active experiments are clearly defined with credible examples of application and how it will help the ARC and/or NDA to achieve its mission faster, cheaper or safer. |

* 1. Funding requirements for Phase 1 visits

Proposal Submission – Academic User Access 2024 Call CONTD.

The applicant should complete this form, disclosing any existing funding already held by their research group (or please make clear why your existing funding cannot be used to cover the visit).

Please make clear exactly what has already been funded, versus the funding you are applying for under this call.

(Once the applicant has submitted the application form to NNL, the NNL technical team will advise on resource requirements so costings can be applied post-submission to enable the Assessment Panel to understand financial requirements of the proposal).

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|  | ARC or NDA funded researcher (e.g. PhD or PDRA on ARC or NDA bursary scheme) | Non-ARC or Non-NDA funded researcher (e.g. independent PhD student) |
| Security Clearance | ARC/NDA (unless applicant holds existing funding) | Does the applicant already have existing funding from an alternative provider, e.g. University, existing grant funding, or NNL? Or is funding being requested as part of this application? |
| Training courses |
| NNL support in the translation of the experimental requirements and preparation of a detailed proposal for the future work/experiment |
| Support completing the required access forms |
| NNL and technical staff and SME to provide detailed advice |
| Travel expenses for attendance at the NNL facility |
| Accommodation during attendance at the NNL facility |
| NNL supervision |
| Any form of salary or payment for work performed by the academic team | Funding not included in this Call |
| Support from NNL scientists on the publication of co-authored posters and production of case studies covering the value of the visit. | NNL (if it were beyond what the researcher already receives from their nominated NNL Industrial supervisor) | Does the applicant already have existing funding from an alternative provider, e.g. University, existing grant funding, or NNL? Or is funding for this portion of the work being requested as part of this application? |

1. <https://www.nirab.org.uk/cdn/uploads/attachments/UK_Fission_RD_NIRO_CATALOGUE_ONLINE.pdf> [↑](#endnote-ref-1)
2. <https://www.nnuf.ac.uk/national-nuclear-laboratory> [↑](#endnote-ref-2)
3. <https://www.royce.ac.uk/partners/national-nuclear-laboratory/> [↑](#endnote-ref-3)
4. <https://www.gov.uk/government/publications/nuclear-decommissioning-authority-strategy-effective-from-march-2021> [↑](#endnote-ref-4)
5. <https://www.gov.uk/government/publications/nda-5-year-research-and-development-plan-2019-to-2024> [↑](#endnote-ref-5)
6. <https://www.gov.uk/government/publications/nuclear-decommissioning-authority-mission-progress-report-2021> [↑](#endnote-ref-6)
7. <https://www.nnl.co.uk/innovation-science-and-technology/showreel/collaborations/alpha-resilience-and-capability/> [↑](#endnote-ref-7)
8. UK Alpha Resilience and Capability (ARC) VMOST, supplied with call document [↑](#endnote-ref-8)