Results of Competition: Sort and Segregate Nuclear Waste: Phase 1

Competition Code: 2004_SBRI_NDA

Total available project funding for Phase 1 & 2 is up to £3.5m (£4.2m inc VAT)

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
ALTRAN UK LIMITED	Phase 1 Altran Autonomous Sort & Segregate for Nuclear Waste	£54,851	£54,851

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
By 2030 the NDA wish to be able to reduce the waste from nuclear decommissioning by 50% at the same time as reducing the decommissioning activities carried out by human operators by 50%. This will require a change in the current state of the art in decommissioning from a human operator based system to an integrated autonomous robot that is capable of sorting, segregating and optimally packaging the waste. Altran's solution to this element of the grand challenges is to combine artificial intelligence and autonomous robots to enable a step change in technology. Using our proven experience in industrialised, high integrity software design within regulated industries and the robotics experience from Cambridge Consultants (part of the Altran group) to deliver an innovative technical prototype solution. Altran UK will lead the Project as systems integrator for this feasibility study, and will develop a solution using COTS robotics and sensors complimented by bespoke AI software developed to sort and segregate the waste. Using existing experience from across the Altran group and its world class expertise centres, Altran offers a wealth of relevant experience and IP in Nuclear Decommissioning, Robotics, AI, Data and High integrity software development. Altran is offering a fully autonomous prototype (based on existing artefacts) that will use a range of sensors to assess the radioactive and physical characteristics of the low level and intermediate level waste. These characteristics will be recorded for audit purposes before the waste is sorted and packed into the appropriate container for onward recycling. Any waste types that cannot be identified using this system will be flagged to the operator for investigation. This will reduce the risk to humans and enable more of the waste to be recycled. This research will provide a prototype which, long-term, will mean the UK is the technology leader in handling nuclear waste. Altran expects to increase IP that when exploited will increase UK employment opportunities through the creation and selling of an exportable Autonomous Sort and Segregate product for Nuclear waste.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
NUVIA LIMITED	NuSORT - Innovative Application of Machine Vision and Robotic Control for Nuclear Waste Sorting and Segregation	£59,354	£59,354

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
The NuSORT project combines NUVIA Ltd's expertise in the manual and semi automated sorting a segregation of nuclear waste products and their tried and tested radiometrics instrumentation, data processing and software currently used on nuclear waste management applications around the world with the latest innovations in industrial automation, machine vision, machine learning and robotics control systems provided by Peacock Technology Ltd who supply this technology on a commercial basis to the oil and gas, agricultural and food processing sectors.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
FORTH ENGINEERING (CUMBRIA) LIMITED	SmartDecay – A next-generation nuclear waste segregation and sorting system	£59,994	£59,994

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
On-going nuclear decommissioning activities in the UK currently cost £3 billion per year and it is estimated that nearly 5 million tonnes of new waste are still to be generated from future decommissioning work spanning the next 100 years. Over 90% of this waste will be categorised as low-level waste (LLW) and its efficient separation from waste with a higher radioactive content (intermediate level waste - ILW) will help to reduce future waste management costs and open up new opportunities for increased recycling of waste. Utilising an innovative combination of robotics, sensor technology and advanced AI, SmartDecay has the potential to radically improve the efficiency with which different types of intermediate and low-level radioactive waste are sorted and segregated, significantly lowering nuclear waste processing costs. The deployment of (semi-)autonomous robotic systems will result in a reduction in the number of direct human interactions with waste and associated handling equipment. This helps to minimise exposure to harmful radiation, lower the probability of work-related injuries and reduce the overall risk to operator health. Radiation sensors attached to the robot will measure and record the radioactive content of every piece of waste enabling classification as either ILW or LLW. Automated 3D scanners and X-ray fluorescence equipment will then be utilised to further analyse waste - determining its size/shape through generation of a digitised 3D model and classifying the waste by material type. After detailed analysis, waste samples will be moved into a temporary segregation area pre-marked with RF-ID tags that will enable the robot to identify specific locations to place waste classified by radioactive content and material type. After segregation, machine learning algorithms will be developed, and high-performance edge computing resources will be deployed to establish optimal packing order for each classification of waste items into appropriate drums and pallet boxes. Final packing of waste containers will be performed by a robot that will utilise state-of-the-art simultaneous localisation and mapping (SLAM) for autonomous navigation around the segregation area. Effective separation of decommissioning waste according to radioactive content and material type will also help to boost opportunities for increasing recycling activities.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
CREATE TECHNOLOGIES LIMITED	ISOsort	£58,621	£58,621

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
This project will deliver a full-scale demonstrator of an integrated and modular robotic system that is proposed to be operated on real nuclear waste. Wastes will be itemised and characterised by mass, volume and material type. Scanning each item with a 3D gamma imaging device, a 3D activity map of each solid will also be produced before being sorted by categories of most interest for potential recycling. A robust record will be produced as the waste passes through the system's process and is finally efficiently packed into an appropriate container. Our team is composed of four member companies, all known for their innovative approach and bringing complementary skills and technologies. The project will aim to develop its solution into a modular ISO Freight container system. This will allow the consortium to offer a modular system to cater for the many and highly varied nuclear waste applications. This concept will therefore be capable of either sorting legacy packaged waste or deal with waste at the point of production, creating an adaptable solution which will allow to maximise waste segregation at source and eliminate incurring additional cost and safety risk observed with the current methods of double handling waste. This process will perform approximately 2.5 times faster than teleoperation, cost 3 times less and be intrinsically safe with operators withdrawn from exposure LLW and ILW will be properly segregated, maximising safe reconditioning and recycling.

Results of Competition: Sort and Segregate Nuclear Waste: Phase 1

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
A.N. TECHNOLOGY LIMITED	WACPAC - Efficient packing of decommissioning waste which meets the waste acceptance criteria for disposal	£60,000	£60,000

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Project description - provided by applicants
WACPAC -- efficient packing of decommissioning waste which meets the waste acceptance criteria for disposal WACPAC is an autonomous system for assigning items from decommissioning operations to the correct waste stream. Particular emphasis is placed on accurate separations at the waste category boundaries and for identifying decontaminable items to minimise disposal costs. The system also supports packing items into containers efficiently and generation of detailed manifests of the package contents. The WACPAC project fuses the nuclear materials assay capability of ANTECH, the machine vision and robotics expertise of ARM Robotics and the University of Birmingham's Extreme Robotics Laboratory (ERL), the advanced X-ray capabilities of Metrix NDT, the stand-off materials identification capability of CAP Fraunhofer and the nuclear knowledge and righall capabilities of the National Nuclear Laboratory (NNL) to sort and segregate random items into the appropriate waste category.

Results of Competition: Sort and Segregate Nuclear Waste: Phase 1

Competition Code: 2004_SBRI_NDA

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
CAVENDISH NUCLEAR LIMITED	OptiSort	£60,000	£60,000

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
Cavendish Nuclear is proposing a fully integrated and automated waste management system to be developed in collaboration with Bristol Robotics Laboratory, Structure Vision, AcroVision, Fraunhofer Centre for Applied Photonics, ImiTec, Clifton Photonics, Babcock International and the Advanced Nuclear Research Centre. The "OptiSort" system integrates leading-edge technology in robotics, automation, 3D imaging, deep-learning, packing optimisation, radiometrics and material analysis, to deliver an autonomous waste sorting, segregation and packing system. From waste pile to consignment container the system will autonomously process and consign a waste item to the appropriate waste route, whilst making full use of the waste hierarchy and recycling opportunities. This innovative solution will automate an otherwise time-consuming and human-intensive process, remove hazard exposure to operators, and realise effective and accurate, waste segregation; and will be cheaper, faster and safer than the baseline approach. Cavendish Nuclear has first-hand knowledge of waste sorting and segregation, and is well-placed to provide the optimum solution and realise the commercial opportunities of the system and its components. Our multi-disciplinary team of SMEs and industry leaders offers extensive experience in design, delivery and commercialisation of waste assay systems, project management of complex innovation tasks, and wealth of knowledge in radiometric technologies. The combined team is committed to providing an innovative, fit-for-purpose, solution to the Innovate UK challenge.

Results of Competition: Sort and Segregate Nuclear Waste: Phase 1

Competition Code: 2004_SBRI_NDA

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
RED MARINE ENGINEERING LIMITED	SASPaC - A modular, autonomous system for the sorting & segregation of nuclear waste	£59,980	£59,980

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
The Nuclear Decommissioning Authority (NDA), Sellafield Ltd and Magnox Ltd have challenged industry to **'develop an integrated, autonomous toolkit which sorts and segregates radioactive waste generated from nuclear decommissioning activities into containers which are optimally packed.'** RED Engineering proposes to demonstrate an effective solution to the above challenge by developing and integrating a range of existing technologies including: * Mechanical Handling * Robotics * Sensor Technology (Imaging, LIDAR, Hyperspectral imaging, Alpha monitoring, Mass) * Control system technology including machine learning At a headline level, SASPaC (Sort And Segregation Packaging Capability) is innovative in that it will be able to import unidentified and diverse radioactive waste, complete sorting and segregation activities and export differentiated (LLW, ILW, Out of Scope) packaged waste for recycling and disposal without human intervention. Currently sorting and segregation of radioactive waste is completed manually so this innovation has the potential to significantly increase the safety and efficiency of operations across the nuclear estate. More specifically, it is innovative in its approach to the handling and identification of different items of radioactive waste. SASPaC will include a self-learning ability to process new and different types and shapes of waste, without relying on a pre-uploaded image database, rapidly reducing the training and commissioning requirements for the system. RED Engineering is a Queens Award winning Engineering and Technology SME based in the North East of England with core competencies spanning mechanical engineering, system integration, robotics and 'agile' product development. Our mission is to deliver engineering projects that make working in hazardous environments safer and we have a proven track record of developing automated solutions for the nuclear decommissioning sector that move humans away from harm. To develop SASPaC we will work with a select team of trusted subcontractors as detailed below: * MJR Power & Automation -- a control and power system specialist * Solent Automation & Robotics -- a specialist in industrial robotics * Taw Associates -- a specialist in sensor technology and data management Each brings industry leading subject matter expertise to address a key area of the challenge and all are existing partners of RED Engineering.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
JACOBS CLEAN ENERGY LIMITED	Segwayste	£59,711	£59,711

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Project description - provided by applicants
Our approach integrates state-of-the-art technology, combined with partners who have long-standing practical experience of nuclear waste sorting and segregation. We will utilise this experience combining cutting-edge artificial intelligence, robotics and data science, drawn from space, defence, medical and industrial technologies, to provide a modular, streamlined, safety-orientated solution that will address the waste sorting and segregation challenge. Our experience in the pragmatic integration of complex technology will generate a step-change in sorting and segregation of intermediate and low-level waste with a focus on recycling. Our solution fully meets the scope of the competition, and is demonstrably safer, faster and cheaper as follows: a) Adopts a nuclear-centred integration approach that innovates a new modular control and automation strategy that can be proven and validated within the nuclear environment (faster, cheaper) b) Draws on cross-sector innovations, and uses a pioneering approach to reliability and fault recovery (safer, faster, cheaper) c) Removes the need for human interaction with nuclear waste (safer) d) Adopts an in-situ waste characterisation strategy removing the need of ex-situ laboratory analysis, building on existing development already being trialled on the Sellafield site (safer, faster, cheaper) e) Delivers a 'live' decision tool that uses data from holistically captured information to route waste based on risk analysis (safer, faster, cheaper) f) Adopts a philosophy of feedstock as waste, focusing on the material, contamination classifications and potential for recycling rather than its original purpose (cheaper, faster) g) Applies automation to the process where this adds most value, i.e. the parts of the process with significant manual off-line effort (faster, cheaper) h) Focuses on development of innovative modular waste handling and processing tools, which characterise, sort and segregate waste, using a repeatable, scalable and transferable process (faster, cheaper) This project will be led by Jacobs and a carefully selected consortium of partners: PA Consulting, Applied Photonics Ltd, V7, The Shadow Robot Company, Industrial 3D Robotics, University of Manchester, University of Bristol and Remote Applications in Challenging Environments (RACE). Jacobs will act as lead integrator of the technical systems to ensure successful delivery of a turnkey solution.

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CHILTON COMPUTING LIMITED	SORTED: scalable sort and segregation for nuclear waste management	£59,743	£59,743

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
SORTED aims to develop an integrated end-to-end technology toolbox for nuclear waste sort and segregation, tracking activities from waste site to waste receiving facility. This will build on our existing IPs, such as large-scale IoT system design and engineering, AI and big data, autonomous robotics technologies, industrial automation system design and implementation. The core of SORTED is connected sort and segregation using modularised components to ensure technology scalability and transferability, minimising laborious manual operations, subjective assessment, inefficiency and errors arising from disjointed processes. The main contractor is Chilton Computing ltd, an innovative UK digital technology startup based at Harwell Campus Oxfordshire specialising in delivering complex IoT system design and engineering services with AI and automation. Three subcontractors are GMV Robotics UK (GMV), Empresarios Agrupados Spain (EA), and RACE UK Atomic Energy Authority (RACE) (phase2 only). GMV is a multinational autonomous robotics systems engineering company. EA is a leading international engineering and construction management company, with 30 years of experience in delivering large nuclear decommissioning and radioactive waste management projects. RACE hosts the national nuclear users facility. Advisory members are Kuka Robotics, ResolveRobotics, and Science and Technology Facilities Council/UKRI national science facilities.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
BARRNON LTD	Barrnon Limited Integrated Sort and Segregate Solution	£59,903	£59,903

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Project description - provided by applicants
In our first SBRI competition entry, Barrnon designed and submitted a robotic solution called BIDS (the Barrnon Integrated Decommissioning System). It can be used to characterize and reduce the size of radioactive assets -- that need decommissioning. The company's new robotic venture is called BLISSS (Barrnon Limited Integrated Sort and Segregate System), building on this previous work. It is a system capable of autonomously identifying, characterizing, picking and placing various debris resulting from decommissioning. BLISSS brings together innovative vision, sensing, machine learning, robotic control, algorithms and formal methods to sort, segregate and verify debris for waste export -- all in accordance with nuclear waste category methodologies. BLISSS is revolutionary in that it can replicate, and radically improve on, the capabilities of a human worker during decommissioning - eliminating the need for human operatives in the hazardous environment to sort and segregate waste. The technology allows an object to be recognized, characterized in terms of substance and radioactivity, verified, manipulated and placed autonomously; also the system is protected by formal methods - a mathematical proof that the system is doing what is required and can _NEVER_ do otherwise, eliminating the uncertainty of augmented intelligence and human error. The system will also increase efficiency and effectiveness: * at the work-face - BLISSS doesn't get fatigued, doesn't get bored, doesn't get life threatening injuries, doesn't need to change out PPE, doesn't have a human dose limitation and can work at the pace brought by robotics and machine learning 24/7\. * due to lack of rework - BLISS does not make human errors, it is as predictable as 1+1=2 due to formal method mathematics. * due to record keeping - all digital, all accurate, all compiled, all verified, always. * due to algorithm derived optimized packing - the system scans the items for form factor and surface area and packs the items taking into consideration Waste Acceptance Criteria. BLISSS is not platform specific. The BIDS platform is flexible and is specifically designed for multiple tool, multiple sensor compatibility, plug and play. However the capability is brought by integrating machine vision, sensing, machine learning and mathematical verification with hardware specifically developed for nuclear cell decommissioning. BLISSS is agnostic to platform. It is a suite of programs and algorithms that can be utilized by typical decommissioning hardware as it communicates via industry standard protocols and languages.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
EDF ENERGY R&D UK CENTRE LIMITED	Digitalised Autonomous System for Nuclear Waste Sort and Segregation	£59,606	£59,606

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
When a nuclear power station enters the decommissioning phase a large amount of nuclear waste is generated. This waste, which is made up of a range of materials with differing radioactive content and intensity, as well as containing other contaminants, needs to be sorted and segregated in an appropriate way; enabling its long-term storage, disposal or for it to undergo recycling. As this task suggests the waste needs to be inspected, classified and moved. Achieving this through human interaction is costly, lengthy and hazardous. The opportunity for remote operations via autonomous systems, presents advantages that overcome these limitations. This project will develop, test and verify the capability of an integrated system to autonomously sort & segregate a nuclear waste pile by remotely moving, processing and packing waste items from a specific area. It will demonstrate the capability to sort waste items based upon radioactive classification and material type, which will include the determination of the composition, size, shape and material surface area. In addition, the system will maintain the capability to retain and retrieve accurate records, which is fundamental to the safe long-term storage of nuclear wastes. The project will have a direct impact on reshaping the UK's nuclear waste hierarchy. The solution will contribute to the UK's nuclear sector deal target of a 20% reduction in the costs of decommissioning. It will also support environmental sustainability and safety by contributing to the NDA grand challenge targets; that include a 50% of decommissioning waste being recycled and a 50% reduction in decommissioning activities carried out by humans.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ATKINS LIMITED	Mobile Autonomous Sort and Segregate System	£59,954	£59,954

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
A robot mounted on a mobile modular system that can be deployed to identify, sort and segregate radioactive waste for safe recycling or disposal. The robot will confront a mass of radioactive waste ranging from metals, to plastics, electrical equipment, soil and more. In order to process it, the robot will first identify an individual waste item using its vision system. The robot will recognise some waste, but otherwise it can be trained by an operative to identify a new waste type by sight. Through machine learning, the more the vision system is used, the more autonomous the process becomes. The system will also measure each item's weight, size, shape, surface area and composition for efficient sorting and packing. Visual recognition of waste is combined with radiometric and chemical characterisation to classify the waste for sorting. After visual identification, each item is picked up by the robotic arm and its level of radioactivity is monitored and it is chemically analysed. The information on the item's physical characteristics, material type and radioactivity level is used to sort the item into the correct waste-stream for safe recycling or storage. Records of this information, together with images of the items will be stored as a record of what items have been placed into each waste-stream. This project innovates on current state-of-the-art by removing the person from the process. This means that there is less risk to the operators from working in hazardous environments. There is less risk of human error in this repetitive task. The process will also be quicker and cheaper than a manual system, offering savings to the UK taxpayer on the cost of decommissioning redundant nuclear equipment and facilities. Combining a robot arm with vision systems, machine learning, nuclear and chemical characterisation systems will mark a new development for nuclear decommissioning. The robot arm can be of any model and size to suit the waste type. A further key innovation comes via the intelligent vision system, which automates the recognition of different forms of waste through machine learning. Human interaction is minimised, creating an efficient, waste-minimising workflow that can adapt to location, segregate waste by various measurable criteria, and will improve the more it is deployed. Waste generated by nuclear decommissioning is therefore dealt with safely, quickly and cheaply, with minimal human interaction, efficiently packing waste containers, and with a diligent recycling process.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
DELKIA LIMITED	Autonomous Sort & Segregate Imagery Software Technology (ASSIST) - providing a specialist integrated solution via model-based systems engineering with assurance overlay for complex real-time systems using COTS for nuclear waste.	£59,951	£59,951

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
Autonomous Sort & Segregate Imagery Software Technology (ASSIST) - providing a specialist integrated solution via a Model-Based Systems Engineering (MBSE) approach with assurance overlay for complex real-time safety systems using Commercial-Off-The-Shelf (COTS) equipment for unmanned nuclear waste sorting and segregation purposes. Utilising the latest in sensory technology for imaging, material detection, and clash detection, ASSIST incorporates sensor fusion capabilities resulting in an unmanned digital delivery solution for future nuclear decommissioning sort and segregation applications. The Delkia led consortia adopts a Model-Based Systems Engineering approach utilising Commercial-Off-The-Shelf (COTS) equipment or modification of the same to become Modified-Off-The-Shelf (MOTS) equipment. This integrated solutions development uses real-time algorithms with additional overlay of formal method tool kits to meet regulatory, safety-critical and mission-critical systems assurance needs. The completed control system will bring together high-tech digital imagery, touch and radiation sensors, proven in use robust and reliable demolition robot, and a specialised packaging station for optimal waste / volume sentencing and integrate the same to a digital immersive environment with cutting-edge configuration management. The in-built data acquisition and processing system makes use of the latest advances in machine learning algorithms and real-time feedback technologies for data tracing and predicative maintenance possibilities - leading to increased reliability and throughout capacities. Resulting in a solution that significantly improves production rates, safety, record keeping and business case justification against conventional manual and semi-automatic methods as used in nuclear decommissioning today.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
VEOLIA NUCLEAR SOLUTIONS (UK), LIMITED	Blended Intelligence for Safe and Efficient Nuclear Sort & Segmentation	£60,000	£60,000

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
Veolia Nuclear Solutions' consortium brings together proven technologies and deep domain expertise from leading nuclear, agritech., space and artificial intelligence practitioners to meet the challenge of nuclear waste sort and segmentation. Our vision is a system that uses a series of tele-manipulators, analogous to a human's arms, that work together with advanced characterisation and tracking technologies to identify, classify, pick up, transfer, trace and package nuclear waste. Operation of the manipulator arms can be under the control of computer intelligence and operate autonomously, or for more complex grabs and tangled wastes, call on the expertise of a skilled operator to take over the task. By sharing the task of the sorting and segmentation of highly heterogeneous wastes between human and computer intelligence, we aim to offer a step change in the safety and efficiency of the current process; only limited intervention by skilled operators will be needed for complex tasks. Our modular approach is focused around building the right intelligence and decision making frameworks to decide how to manage and classify the waste, and the right waste manipulation capability to separate the waste and get it where it needs to go. Input sensors for characterisation, and configuration of the manipulator platform, will be designed to be easily changed to suit the waste being sorted making the approach transferable across waste streams and sorting locations. The technology looks to enhance operator capability with autonomous operation whilst removing them from the hazardous environment. Efficiency scales as the number of manipulator units deployed per operator. Importantly this builds in flexibility for waste practitioners to determine the right mix of human/autonomous capability by stream and improve with time as the system and operators learn. Leading the project is Veolia Nuclear Solutions UK (VNS), an expert in nuclear robotics and developer of DEXTER TM. VNS will be supported by the University of Lincoln providing automation and force guidance technology, Faculty providing the artificial intelligence for waste tracking, packing and physico-chemical characterisation, and Createc, a specialist in radiological detection equipment and characterisation.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
AB5 CONSULTING LTD	GaViX - Fully Automatic Sorting Systems for nuclear waste	£59,976	£59,976

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
GaViX delivers an innovative, integrated solution to address the issue of sorting and setting apart components of radioactive waste quickly and effectively. The solution benefits from the advances in artificial intelligence and automated processes to detect and sort radioactive materials, in addition to X-ray and sensors technology, optimised to be very small sized and low cost, to significantly increase the spatial resolution and integration times. Following a study of the Sellafield site and in-depth research and evaluation of user needs, a first step in the study will identify requirements and define a comprehensive approach, including an economic and financial assessment, project planning and risk assessment. A draft for validation and verification procedures and criteria of the experimental prototype follows. The feasibility study phase will define a roadmap for developing and testing the prototype during Phase 2\. In line with the NDA Grand Challenges for Technical Innovation, our proposal makes use of remote sensing techniques to allow smart and effective detection and sorting of radioactive waste, including multi-layer flexible packaging that was developed and designed specifically for radioactive low-level waste. The adoption of autonomous systems, sensors and robotics will permit safer methodologies and techniques for human operators, again meeting the Grand Challenges objectives. The use of advanced technology and artificial intelligence will improve data collection and make data analysis easier. AB5 Consulting, a London-based SME, is the project lead. AB5 has gathered a strong team of subcontracting experts of international renown, each one contributing specific knowledge coming from the research, nuclear, processing and packaging sectors. The Italian National Institute for Nuclear Physics (INFN) provides the technology for the radiation detectors, as well as all the know-how about the context and domain of nuclear physics. IRIS, hi-tech producer of advanced solutions, owner of patented AI algorithms and image processing techniques for food processing. PacTec, industry leader for the design and manufacturing of certified flexible packaging solutions for low level radioactive wastes according to the requirements of IAEA regulations for the 'Safe Transport of Radioactive Material', SSR-6 and ADR.