



**EARLY MARKET ENGAGEMENT**

**PRIOR INFORMATION NOTICE**

**INTENTION FOR AN OPEN MARKET COMPETITION**

**PROVISION OF A NEW OPERATIONAL CAPABILITY FOR THE  
BREAKDOWN OF ORGANIC MATTER IN A NUCLEAR FUEL STORAGE POND**



### **Background:**

The Pile Fuel Storage Pond on the Sellafield site is undergoing clean-up operations, involving the removal of the remaining pond inventory and decontamination of the pond prior to dewatering and demolition. Due to the development of algal blooms in the pond experienced over many years, biofilms coat the inner pond walls, pond furniture and pond inventory. In addition, a bed of sludge, rich in organic matter (approx. 75%), has accumulated on the pond floor.

### **Problem statements:**

Seasonal algal blooms adversely affect pond water visibility, which in turn significantly impacts on the ability to undertake in-pond clean-up operations. Moreover, the physical recovery of biofilms and organic rich sludge from the pond results in the generation of radioactively contaminated material that has to be conditioned and stored prior to long term disposal in a Geological Disposal Facility (GDF).

Sellafield Ltd are interested in any technologies that will facilitate the control of algal blooms as well as the natural breakdown of organic material present within the pond, which would reduce the need to physically retrieve, condition and store the material.

### **Request for Information**

This Prior Information Notice (PIN) is seeking a capability from the supply chain for suitable potential solutions to the organic matter impacts within Sellafield's Legacy Ponds. This will be a new capability installed within the facilities intended to be in permanent operation.

Sellafield is interested in exploring a range of potential technical solutions and is encouraging submissions which may be new or emerging technologies. Algal mitigation solutions are well established within the industry but its application within the constraints of a nuclear legacy ponds is limited.

The functional specification below outlines the capabilities required to which a potential solution can be recommend. Whilst a single solution would be preferred, multiple solutions may be suggested.

### **Task Functional Specification required for the desired technology:**

- Be able to breakdown biofilms
- Be able to significantly reduce the organic fraction of the sludge that has accumulated on the floor of the pond
- Be able to reduce the duration and intensity of algal blooms within the pond
- Should not involve the use of chemicals such as biocides
- Due to the radioactive nature of the pond contents, the technology should be deployable within the pond and not require the removal of water from the containment of the pond
- Be mobile, occupying a footprint of no more than 1 m<sup>3</sup> and weighing less than 100 kg
- Power supplies will need to be compliant with available supplies within the pond facility (i.e. 240 V DSN Decontactor sockets)
- Compatible with facility infrastructure (i.e. will not require additional ventilation systems)

- Have no adverse impact on the physical integrity in the pond structure (re-enforced concrete), pond inventory (mild steel carbon) or installed retrieval equipment such as Remotely Operated Vehicles (ROV's)
- Should not result in the floatation of fine sludge particles to the pond water surface
- Should be simple to operate and be able to operate reliably in a radioactive environment with minimum maintenance and minimal requirement for re-calibration.
- Be CE Marked and available with Operation and Maintenance Manuals
- Be designed and fabricated in such a way to allow the removal/decontamination of radioactively contaminated material.

Sellafield will welcome implementation experience from the supply chain to the above specification and whether further technical dialogue is required.

Should the proposed mitigation solution be able to meet the above criteria, Sellafield can cater for a supplier visit at a future date including a possible technology demonstration option.

Following the close of the PIN response window, proposed solutions will be reviewed to assess future market engagement steps.

