



# NSG

legacy management



## Project Profile

# Sellafield HAW Thermal Treatment Programme

NSG is currently supporting Sellafield Ltd's ambition to realise a thermal treatment capability on the site and has developed clear strategies that are helping to resolve some of the nuclear industry's biggest challenges by reducing the volume of Higher Activity Waste (HAW) requiring disposal and improving long-term sustainability. Thermal treatment technologies offer the opportunity to both reduce the volume of waste requiring disposal and create waste product that is inherently stable. In late 2019, NSG facilitated a tiger team exercise to investigate what needs to happen next in the journey to deploy thermal treatment technologies to treat Sellafield's HAW. That exercise determined that three waste streams (plutonium contaminated materials (PCM), pumpable wastes and non-bulk metal miscellaneous beta-gamma wastes (MBGW)) should be targeted for active pilot facilities, which would be the next step towards proving the viability of the technology towards deployment at Sellafield.

Since January 2020, and building on the output of the tiger team, NSG has been assisting Sellafield to provide the required underpinning and to identify all the study activities needed to progress the pilots towards their successful realisation, within the constraints of a nuclear licenced site. Through the application of a strategic Data Quality Objectives (DQO) approach, NSG has undertaken exercises to determine the R&D requirements to design, implement and operate active pilots to treat PCM and pumpable wastes. Working in collaboration with key experts from several organisations, including Sellafield, RWM, TÜV SÜD, RED Engineering, Cerberus Nuclear and National Nuclear Laboratory, this work led to a comprehensive and detailed understanding of what should be learned from each pilot, together with an understanding of the current information gaps associated with their delivery.



*Joule Heated Ceramic Melter with a SIXEP Magnox sludge test material*



*Plasma with a mixed PCM test material*



*Joule Heated Batch Melter with PCM and SIXEP Magnox sludge test materials*

*Photographs courtesy of Chris Mounsey, Sellafield Ltd*

The output from the DQO exercises allowed NSG to develop work breakdown structures (WBS), technology roadmaps (TRM) and programmes of work defining the optimal routes for the progression of both the PCM and pumpable waste active pilots. The work has enabled Sellafield to commence their engineering design activities, with a clear understanding of the key challenges which will require resolution. NSG's robust and efficient approach has identified the benefits of the application of thermal treatment to HAW for Sellafield and the wider nuclear industry, providing a clear direction and way forward to a challenge that Sellafield has struggled with for many years. This work has mapped out a journey which will hopefully result in a significant reduction in the volume of HAW for disposal on the Sellafield site in the near future.

### **The Benefits of NSG's Approach**

- Complex problem solving and the ability to develop clear strategies.
- Development of robust and underpinned development programmes.
- Preparation for and facilitation of workshops to tackle complex challenges, including the application of strategic DQO.
- Application of a robust structure and methodology to challenging studies.
- Use of work breakdown structures, technology roadmaps, work programmes and technical specifications on complex topics to define the optimal routes for progression.
- Experience in stakeholder mapping and engagement.