

Overview

Sellafield Ltd was concerned about the arrangements in place for alpha-decommissioning following incidents involving contaminated wounds. The underpinning concern was that man-entries in air-fed suits were being undertaken during decommissioning without a full appreciation of all attendant risks or due consideration or knowledge of other options that may be available. Sellafield Ltd contracted Nuclear Technologies to carry out an independent review to satisfy the site that the principles of ALARP (As Low As Reasonably Practicable) were being properly applied. This initial challenge was addressed through two parallel tasks:

- A systematic review was undertaken of the methodologies applied in deriving the safety case for a typical alpha decommissioning project. That review confirmed that the major hazards associated with the selected methodology had been appropriately identified and that the overall risk associated with the work had been deduced in a robust and defensible manner.
- A much broader study was undertaken to understand both the drivers for the hands-on, air-fed suit approach adopted and the advantages and obstacles to the wider use of alternative technologies. This broader study formed the bulk of the work and a holistic approach was taken. Waste led wiring diagrams were developed illustrating the complete waste management cycle associated with the current practices and highlighting the key obstacles to alternative approaches. A schedule of the Research and Development tasks required to eliminate those obstacles, and potentially reduce overall risk across the waste management cycle, was subsequently developed.

Further Work

While this output was sufficient to address the original concerns of Sellafield Management to a degree further work was required to embed the ideas developed into Sellafield Ltd processes. This work was delivered through a second contract which undertook three further tasks:

- The Research and Development schedule from the initial work was further developed and interrogated to identify a series of key tasks and investments necessary to enable alternative processes to be used or identified.
- A detailed study was undertaken into the feasibility of using a 'bigger box' as a disposal container for alpha contaminated wastes. This had emerged from the first study as a key driver in risk reduction with the number of air-fed suit entries and risk of wounding being directly proportionate to the number of size reduction activities required to enable waste packaging for disposal.
- A range of techniques were identified for establishing project risk at each stage throughout the decommissioning and waste management lifecycle. This 'toolkit' was trialled for an existing alpha decommissioning project and demonstrated the feasibility of making ALARP informed decisions throughout the decommissioning process.

This holistic, 'end-to-end' assessment methodology was incorporated into a Supporting Procedure underpinning the Sellafield Site Procedure for decommissioning.

That toolkit includes:

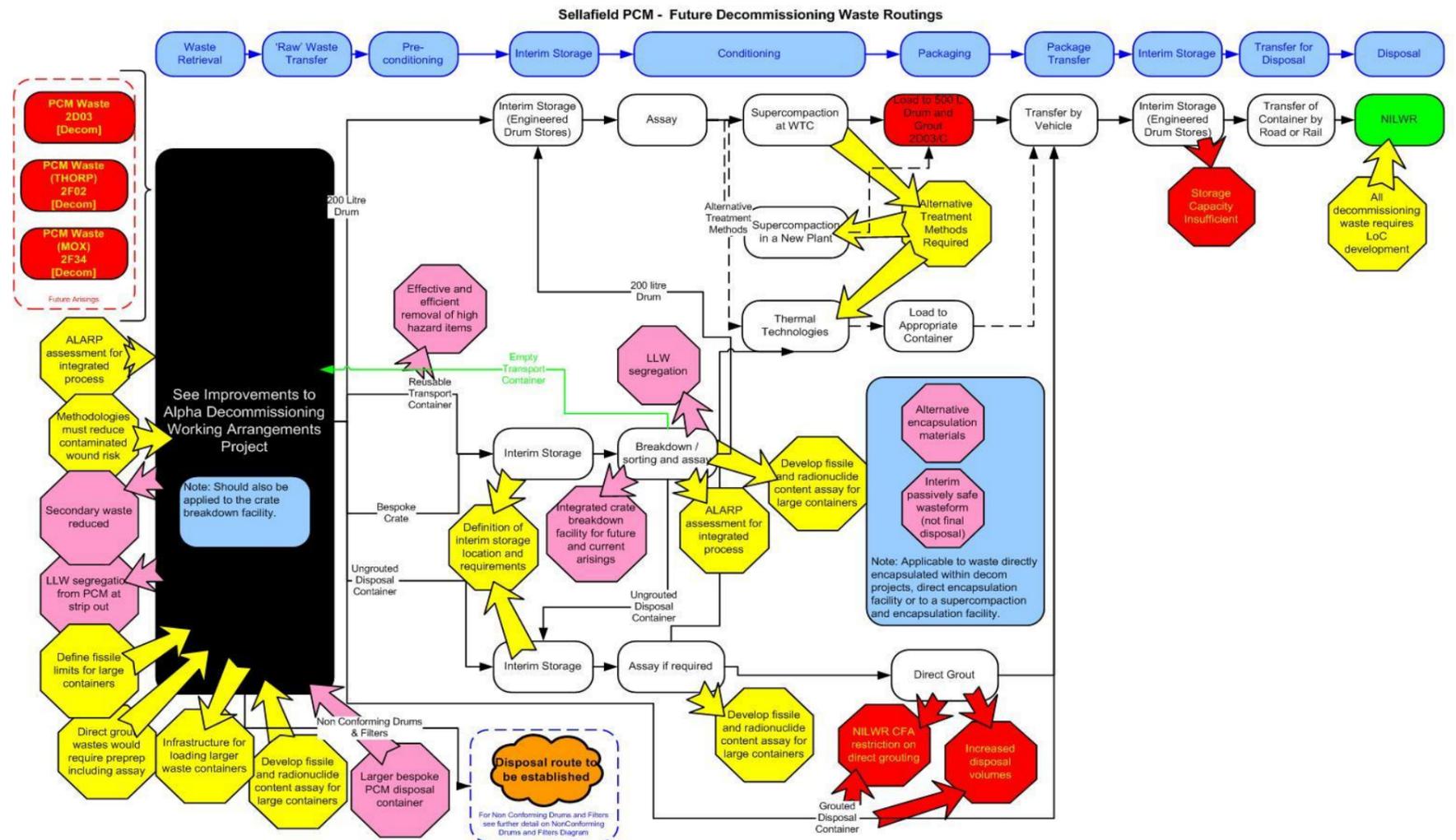
- Guidance notes and production of a proforma for ALARP justification of any proposed decommissioning project prior to commencement of detailed planning;
- Guidance on the benefits of producing strategic wiring diagrams for individual projects;
- Multi Attribute Decision Analysis guidance for the selection of strategic options and, subsequently, approaches to particular tasks;
- Development of a Microsoft Excel based 'de-selection tool' supporting identification of techniques available to conduct particular tasks.

Value added for Client

As a result of this work, the client has:

- A fuller and more transparent picture of the inter-relationships between alpha decommissioning projects and the subsequent waste packaging and disposal routes
- A risk informed schedule of potential Research and Development tasks necessary to reduce the lifetime risk associated with alpha decommissioning and subsequent waste packaging and disposal
- A structured procedure for the demonstration of ALARP informed decision making throughout the project lifecycle

This outcome would not have been possible without the combined efforts of personnel experienced in the application of safety case methodologies, the application of ALARP, Plutonium Contaminated Material (PCM) waste management, alpha decommissioning planning and decommissioning methods. All of this necessary expertise was drawn from the pool of Nuclear Technologies personnel.



For further information please contact: Tel: 01847 805070

Email: info@nuclear.co.uk