

## **Revised Arrangements for the Management of Solid and Non-Aqueous Radioactive Waste – 12452**

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### **ABSTRACT**

In 2010, Atomic Weapons Establishment (AWE) identified a requirement to implement revised management arrangements for the generation, storage and disposal of radioactive waste. A thorough review of the current arrangements/processes was undertaken which included both legal compliance requirements and the identification of business improvement opportunities. On completion of this review a suitable project team was established and in 2011 an integrated Radioactive Waste Management process was implemented throughout the business. Initial results have shown measurable improvements within Radioactive Waste management compliance, operator understanding and increased business efficiency.

### **INTRODUCTION**

AWE generates a diverse range of Radioactive Waste arising from decommissioning, demolition, refurbishment, and operation of its facilities. Historically, these wastes were managed in accordance with company level waste management documentation along with both a paper based and ageing electronic database system. Consequently monitoring waste related costs, demonstrating adequate control of waste, providing an optimised waste service, and implementing waste management strategies were difficult to achieve cost effectively.

AWE has therefore implemented a Service Delivery Model for waste services based around a Waste Route (proving the service), a Waste Specialist (setting and monitoring standards for the Company & Route), and Waste Officers (as local coordinators). This introduces a suite of optimised processes to document the operation of each waste disposal option and how they interrelate. Process maps identify key documents and those responsible for each step, supporting demonstration that AWE's approach is optimised. This is a requirement of AWE's Nuclear Site License and environmental Permits.

### **PROJECT AIM**

The aim of the project was to streamline the Company's management of radioactive waste, using an integrated framework, to deliver a focused, flexible, cost effective, and demonstrably compliant waste management system.

It was therefore proposed to implement a model that:

- Delivered Waste services through a discrete waste route: Radioactive Waste Management;
- Operated a Waste Helpdesk that provided the main customer interface advice and recorded information that will be used for continuous improvements in service effectiveness;
- Utilised a Service Catalogue to specify the range of services provided and their associated performance targets;
- Utilised Service Interaction Agreements to identify the key responsibilities and requirements needed to support the business;
- Utilised Process Maps with short supporting documentation to control and explain how services are provided and ensure those services are undertaken in a compliant manner;
- Utilised Quality Control Plans to formally demonstrate compliance with key processes and provide an audit trail;
- Operated within a clearly defined organisational structure to provide accountability, cost visibility, and management escalation;
- Appointed key personnel to manage compliance, service delivery and to ensure appropriate standards are maintained across the sites;
- Delivered a new electronic Radioactive Waste database that would be used by all authorised personnel within the business while providing a higher degree of functionality than the previous system, and;
- Reduced the risks associated with human error.

## **RESULTS**

Throughout 2010 and 2011 a team of Radioactive Waste Specialists along with technical database program developers successfully achieved the project requirements. This resulted in the implementation of the revised working arrangements during August 2011. The benefits associated with the new arrangements have been several fold and include those detailed below:-

### **Process Maps**

During the initial project scoping work undertaken it was identified that the company's arrangements were complex, fragmented and recorded in such a way that employees could not easily identify requirements. To resolve this situation, process maps, Figure 1, were generated for both the waste generators and the on-site Waste Management department to utilise.

## Radioactive Waste Management

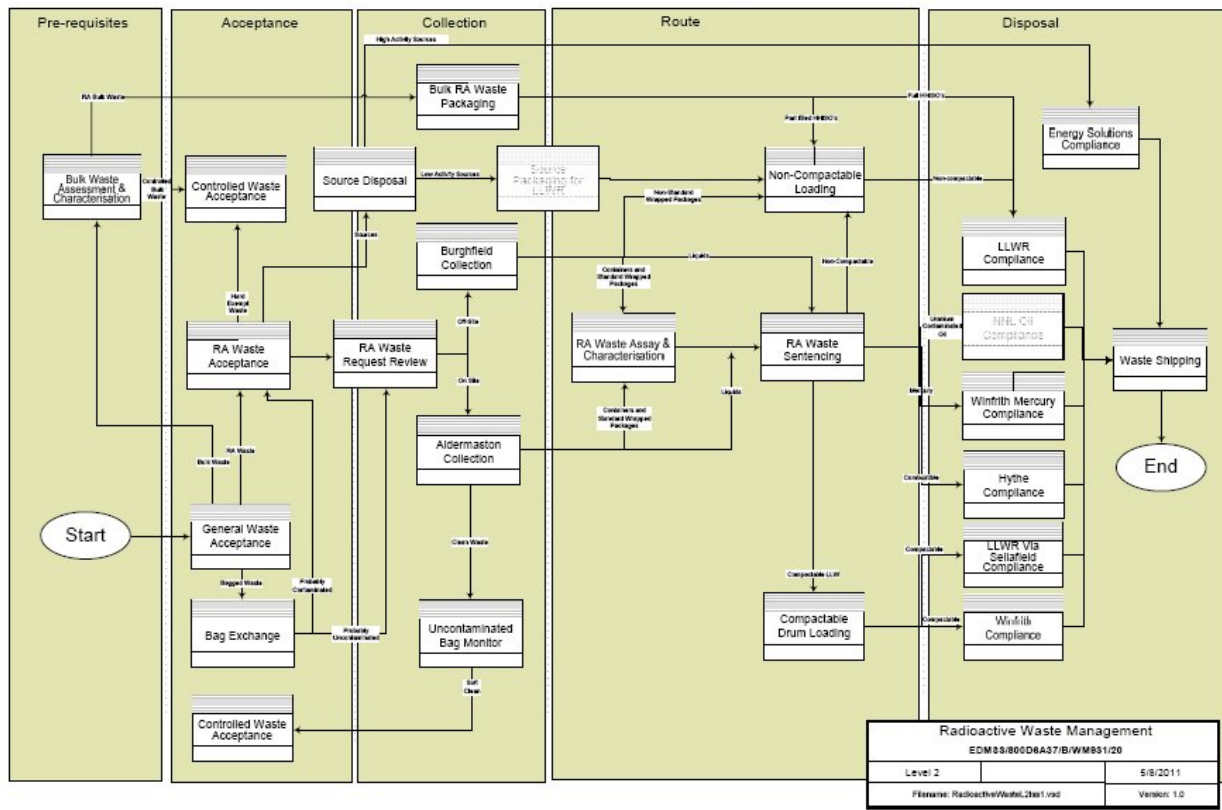


Fig 1 – Top Level Process Map

These maps provided individuals with a simple, visible, end-to-end process for each key stage of the Radioactive Wastes lifecycle, from initial generation on site to acceptance by the Waste Management department for either onward storage or disposal within the UK. Each of the process maps generated record the key activities required of the accountable persons along with a range of supporting documentation available to assist them in meeting these requirements. The supporting information was hyperlinked to the process map and included guidance notes, operating instructions and Conditions for Acceptance.

By providing individuals with appropriate information and supporting documentation they also ensured the business worked within a designated legal framework and therefore parties acted in a co-ordinated manner all.

### Electronic Data Management System

As part of the initial project review it was identified that the current electronic data management system was over 10 years old, was a single user system, could no longer be supported in it's current format (Microsoft Access) and the business frequently recorded issues relating to its reliability which impacted on the overall effectiveness and efficiency of the Waste Management department. As part of the new arrangements, an

IT development team was established to generate a modern standard system that could be accessed by multiple users across the business. The system that was developed and implemented utilises Microsoft Dynamics software to record all of the information associated with the individual waste item. The information associated with the Radioactive Waste is initially recorded within the system by the waste generator at the point of waste production. Additional information is then added to the individual record throughout its lifetime through completion of various information screens within the database, along with the attachment of scanned versions of paper based records such as Real Time Radiography images, Container Fill Sheets, Photographs, Assay Equipment Result Sheets, etc (Figures 2 and 3). The system also generates a unique bar-coded label which is attached to the waste item and through the use of both the database and barcode readers all movement, stock takes and subsequent location changes can be logged within the system. This reduces the potential for human error that was associated with the previous system which relied heavily upon hand annotated paper records. Along with the individual waste item information the system includes appropriate warnings to alert operators when limits and conditions could be breached. Examples of these include individual weight package limits, transportation limits and identification of total fissile material holding limits for specific storage areas.

The specific waste item record within the database is also utilised to manage the disposal of radioactive waste to disposal sites within the UK. The system allows the Waste Management department to allocate specific waste items to transport containers and generate shipment documentation which complies with the relevant disposal sites Conditions for Acceptance. This documentation is then utilised to comply with the UK Radioactive Waste Transport Regulations. Once shipments have been completed, the system will automatically update the site inventory and deduct from the totals of the various annual allocations that have been agreed with the disposal sites.

Fig 2 – Container Record Screen

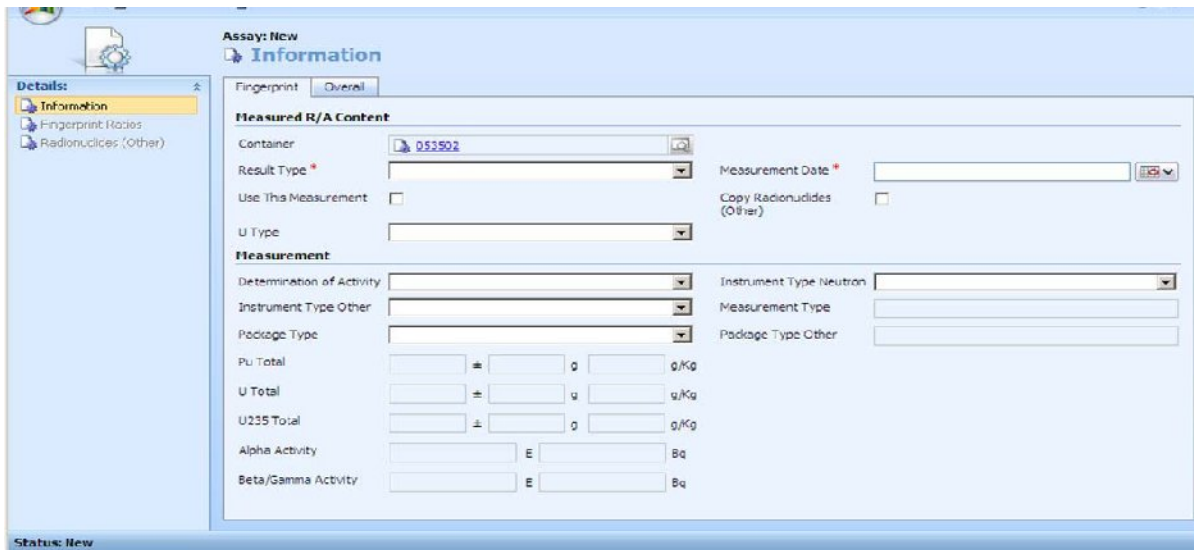


Fig 3 – Container Assay Result Screen

### Service Delivery Model

The revised radioactive waste management arrangements utilise a service delivery model to provide on-site waste producers with assistance. The service model incorporates a service helpline number which is accessible to all. Once contact is made by the waste generator a unique call reference number is associated with the individual's requirements and the request progressed. In developing this model a service catalogue was produced which recorded each of the individual services required by the business along with completion targets. These services vary from technical support from a Radioactive Waste Specialist to the collection of Radioactive Waste from a specific donor facility.

The implementation of this model gave the Waste Management department suitable information to both understand the business requirements and measure the level of service provision being achieved. To ensure continuous learning from experience monthly reporting of the department's performance against the service catalogue targets is undertaken. An example of some of the information cascaded can be seen in Figure 4.

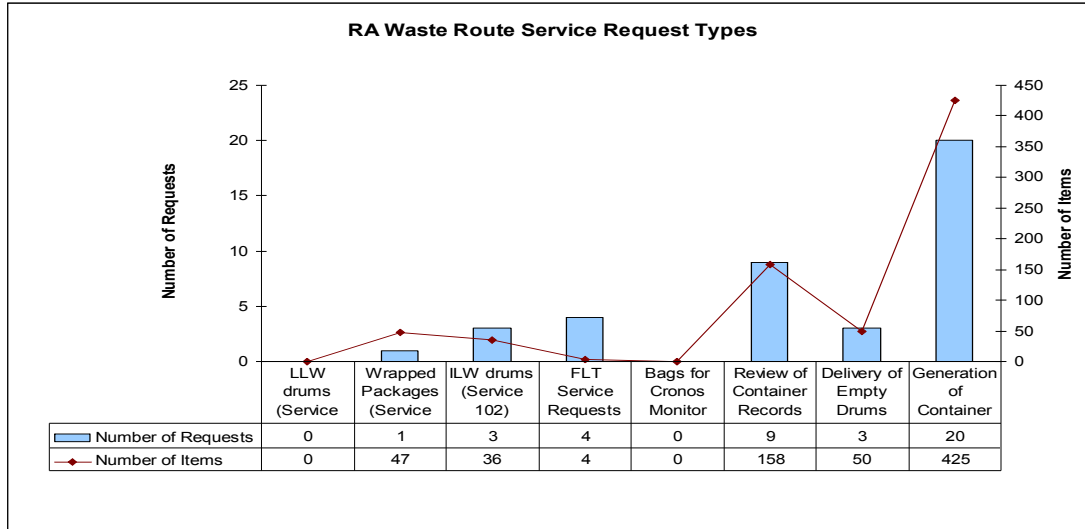


Fig 4 – Monthly Service Requests by Type

The new arrangements also called for the generation of Service Level Agreements between Waste producers and the on-site Waste Management department. These agreements record the key individual accountabilities of staff along with the predicted waste arising for each waste producing facility on the site. This information is used to measure compliance with the Waste hierarchy and to ensure the business can accurately predict future waste production; therefore ensuring suitable disposal and storage facilities are available.

## CONCLUSION

Through the development and implementation of the revised working arrangements AWE has been able to continue to demonstrate both legal compliance to its regulators along with business efficiency and effectiveness improvements.

Simple to follow process maps have improved employees understanding of Radioactive Waste management requirements, provided them with easily accessible information and ensured the business operates in a single coherent manner. The implementation of a modern electronic data management system has ensured all waste related information is easily retrievable and appropriately maintained. The additional functions that have been built into the system have reduced the potential for human error and increased the overall efficiency of the Waste Management department through the use of the automated report generation functionality.