Sellafield Ltd

Sellafield Ltd – Summary for Cumbria MWLP Examination, Dec 2016

Overview

Sellafield Ltd is the company responsible for safely delivering the decommissioning of the UK's nuclear legacy as well as fuel recycling and the management of low, high and intermediate level nuclear waste activities on behalf of the Nuclear Decommissioning Authority.

Sellafield Ltd is based at Sellafield in West Cumbria, with engineering, design and functional support capability provided by employees based at offices in Risley, near Warrington.

Under the ownership of the Nuclear Decommissioning Authority and operation by Sellafield Ltd, the focus on site today is safe and secure risk and hazard reduction.

The current timescale for the delivery of the NDA's mission to successfully decommission the Sellafield site stretches out to 2120

Site activities

Spent Fuel Management

- Thorp reprocessing - The Thermal Oxide Reprocessing Plant combines all of the facilities needed to reprocess spent oxide fuel. It reprocesses both UK and foreign spent fuel. Thorp reprocessing is scheduled to come to an end in 2018/19 financial year.
- Ongoing receipt of AGR fuel - Sellafield Ltd provides a core national service, supporting UK electricity generation capacity through receipt of spent fuel from AGR power stations. Advanced Gas-cooled Reactor fuel is reprocessed in line with contractual commitments. Any fuel that is not reprocessed, in line with NDA strategy, will be stored on an interim basis in the Thorp receipt and storage pond pending packaging and disposal in a future Geological Disposal Facility.
- Magnox reprocessing - Magnox reprocessing involves the decanning and dissolution of spent Magnox fuel arising from the existing fleet of Magnox reactors. Magnox reprocessing is expected to be completed in financial year 2020/21.
- Nuclear Materials - In support of NDA strategy, this programme includes the receipt, safe storage and management of nuclear materials. This includes the receipt of materials generated from across the NDA estate.

High Hazard and Risk Reduction

This stream of activities focuses on legacy ponds and silos from the early phases of the UK nuclear programme, and covers bulk retrieval of materials for treatment and onward storage in fit for purpose facilities. The legacy areas are:

MSSS - The Magnox Swarf Storage Silos building was constructed for the underwater storage of swarf, the external cladding removed from Magnox nuclear fuel. Originally constructed in the 1960s, three further extensions were added in the 1970s and 1980s providing in total twenty two individual compartments within the silo. It received swarf from the First Generation Magnox Storage Pond and the Fuel Handling Plant, along with a range of other metal items of intermediate level waste.

FGMSP - Opened in 1962, in its 26 years of full operations the First Generation Magnox Storage Pond processed around 27,000 tonnes of nuclear fuel, nearly 2.5 million fuel rods.

PFSP - Built and commissioned between 1948 and 1952, the pond and adjoining decanning building originally provided the storage and cooling facility for irradiated fuel and isotopes from the two Windscale reactors. The pond processed 2,100 tonnes of pile fuel and 300 tonnes of Magnox fuel. The PFSP contains over 15,000m3 of radioactive water, more than 300m3 sludge, various nuclear wastes and legacy spent nuclear fuel in 180 metal skips in the pond

PFCS - These silos are 21m high, with six individual waste containment compartments holding over 3,400 cubic metres of intermediate level waste, the equivalent of 30 double decker buses. The waste has been stored since 1952.

Decommissioning

The decommissioning programme at Sellafield completes the decommissioning of some key non-operational buildings and uses the learning from this to set the strategy for the future decommissioning for the remaining facilities on the site.

Waste Management

Sellafield manages its waste in accordance with a waste management hierarchy of Prevention, Minimisation, Re-Use, Recycling and Disposal. The techniques used to achieve this include waste treatment (decontamination and melting for metals re-cycling, incineration of some soft solid wastes), super-compaction and use of alternate disposal routes (CLESA or permitted landfill sites for some Very Low Level Wastes).

- The integrated nuclear waste management programme seeks to reduce waste volumes arising as part of current activities as well as historic operations and ensuring waste is stored safely
- In order to facilitate the continuing safe storage of all forms of nuclear waste within the existing Sellafield site (other than LLW – see below) and to expand our current capability and capacity, new storage and processing facilities will be required.
- Highly Active Liquor (HAL) - Highly Active Liquor is classed as high level waste and is a by-product of reprocessing spent nuclear fuel. It is treated at Sellafield in the vitrification plant where is it converted into a solid (glass) stable form for long term storage on site or transport to overseas customers. To manage current reprocessing contracts and to facilitate post operational clean-out of existing facilities, it is currently estimated that vitrification will continue at Sellafield until 2030.
- ILW treatment and storage - Intermediate level waste includes materials such as fuel element cladding, contaminated equipment and radioactive sludge. It comes from current commercial activities as well as historical operations and current decommissioning work.

At Sellafield, ILW is put into stainless steel containers, which are then filled with cement grouting before being placed into a special above-ground storage facility on the site. The packaged material will be transferred for long term storage in a geological disposal facility (GDF) when this is available.

- LLW treatment - Low Level Waste makes up the largest physical volume of radioactive waste. It is only slightly radioactive and includes things like protective clothing, laboratory equipment, paper towels and gloves etc., items that have been used in the controlled areas.
  Under the waste management hierarchy potential LLW is sorted and segregated, with final destination being dependent on the most appropriate route of re-cycling, incineration, super compaction or direct disposal. For disposal at Low Level Waste Repository (LLWR) current treatment involves placing the waste inside boxes/drums which are monitored, with some of these being compacted down to a quarter of their original size using a high force compactor for disposal at LLWR. SL is committed to safely managing low level waste and processing it to reduce the volume of waste which needs to be disposed of at the LLWR.
- PCM treatment - Tools and equipment that come into contact with plutonium during operations are classed as “plutonium contaminated materials”.
  These are treated as a form of intermediate level waste. Generated materials are packaged in interim containers which are compacted, placed in a stainless steel container and encapsulated in cement, making the material suitable for long term storage. This stream will also be disposed to the GDF.
- Effluent management - Effluents include liquid and some solvent wastes that are primarily by-products of Sellafield’s reprocessing and decommissioning activities.
  Effluent is managed in two sets of plants – the Low Active Effluent Plant and the Site Ion Exchange Plant.

Planning Authority Arrangements

Cumbria County Council (CCC) is the Planning Authority for waste related planning applications. Those relating to ongoing industrial activities are assessed by Copeland Borough Council (CBC). A well-established communication route is in place for early sharing of forthcoming planning applications. This is supplemented by a Planning Performance Agreement with both CCC and CBC, for specific projects. A quarterly update and review meeting gives periodic updates, and is often accompanied by site visits for familiarisation of the local context prior to submission of applications. As screening letters and applications are submitted specific meetings and site visits are scheduled as required.

In recognition of increasing consultation and scrutiny expectations Sellafield has developed a Context Plan for use by the Planning Authorities, and is developing an integrated site wide master planning approach to ensure an efficient and spatially integrated approach to land allocation and use within the Nuclear Site Licence boundary.

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