Waste Acceptance Criteria

Studsvik Metal Treatment - Customer Owned Waste Service

Report Reference: WAC/MM/UK

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Studsvik

REVISION SHEET

Rev.	Description	Revised By	Checked By	Approved By
B	Lead treatment included. New Guidance Document referenced. Other minor revisions	David Rossiter	Bob McGeary	Joe Robinson
C	Full Revision to include Metals Recycling Facility, Workington	Chris Woodley	Joe Robinson	Kevin Wilkinson
D	Full revision to align document with Customer Owned Waste service. Document fully reviewed for primary treatment at MRF	Craig Broadbent	Simon Dickson	Mike McMullen

INTRODUCTION

This document sets out the Waste Acceptance Criteria (WAC) established by Studsvik UK Limited for our Customer Owned Waste Metal Treatment Service. It covers the requirements for acceptance of metallic wastes into the Studsvik Metal Recycling Facility (MRF) for projects where ownership of the wastes - including secondary wastes generated during treatment - shall remain the responsibility of the consigning customer. An alternative set of Waste Acceptance Criteria exist for projects where ownership of wastes will transfer to Studsvik for onward management.

The Customer Owned Waste Service operates on the basis that all secondary waste (including any non-compliant wastes) and any metal unsuitable for exemption is returned to the customer. As such the customer shall be required to sign a Waste Return Guarantee to confirm acceptance of their wastes following treatment. This includes the return of any waste generated as a result of treatment at our Swedish facility (if required).

Importantly, Studsvik are also able to consider a much wider range of materials for treatment. Our process operations are designed for maximum flexibility allowing a wide range of metallic LLW, which may fall out with the Normal Operating Parameters, to be successfully processed. For such waste a **Treatability Model** is applied by Studsvik to determine wastestream specific Waste Acceptance Criteria which can then be utilised as a basis for acceptance of wastes under the customer owned waste service. The key considerations of the model are also presented in this document.

A separate document, 'Metal Treatment Service – Consignor Guidance' provides further details and interpretation of these Waste Acceptance Criteria.

For further information on the WAC, please contact:

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NORMAL OPERATING PARAMETERS

Waste to be treated must be contaminated low level metallic waste. In addition to this there are a number of general criteria which, if complied with, ensure that the waste can be successfully processed. These basic criteria, or Normal Operating Parameters, are as follows;

- General containerised metallic scrap[1]
- Surface dose rate up to 0.2 mSv/h, averaged per item, with no hot spots above 0.5 mSv/h[2]
- Dose rate at 1m up to 0.1 mSv/h
- Metallic surface finish or painted surface coatings[3]
- Acceptable materials: steel (carbon and stainless), cast iron, aluminium, copper, lead, brass; and cables[4] with copper and/or aluminum conductor
- Fingerprint to be predominantly beta/gamma and/or low toxicity alpha[5]
- Material thickness greater than 3 mm
- Average specific activity per container < 500 Bq/g
- Individual item weight limit of 5,000kg[6]

Studsvik's waste facilities are designed to accept containerised scrap metals and larger items and components. The minimum acceptable quantities, per campaign, acceptable under a retained ownership model are:

- Stainless Steel 5 tonnes
- Carbon Steel 5 tonnes
- Cast Iron 5 tonnes
- Aluminum 2 tonnes
- Brass 3 tonnes
- Copper 3 tonnes
- Lead 2 tonnes
- Cables 5 tonnes

Notes

1 Not including complex assemblies (pumps, motors etc)
2 Where dose rates above 0.2 mSv/h are measured, these should be identified by permanent marking.
3 Metal waste should be either uncoated or have a nominal painted finish. Thick paint, bitumen, or other thick coatings or deposits are outside Normal Operating Parameters and require prior approval.
4 Cables: minimum length 100mm, minimum diameter 3mm, maximum diameter 50mm with PVC insulation. Single or multi strand conductors are acceptable.
5 Fingerprints containing enriched fissile activity are outside Normal Operating Parameters due to criticality risk and require prior approval.
6 Individual weights above 5,000kg are routinely acceptable but must be notified to Studsvik to ensure that suitable arrangements are made for their removal and transport within the facility

Customers must contact Studsvik in advance when their waste falls outside the Normal Operating Parameters. Treatability issues for wastes outside Normal Operating Parameters are described in the Treatability Model section.

Studsvik reserves the right of audit of customer processes to determine that waste is in accordance with these Waste Acceptance Criteria. This includes the process for determining the nuclide fingerprint of the waste. Acceptance of any waste for treatment is conditional to the prior approval of this process by Studsvik through the submission of Form 247 "Application for Waste Treatment at the Metals Recycling Facility" (see "Initial Enquiries and Delivery Information").

Studsvik reserve the right to vary these Waste Acceptance Criteria from time to time.

EXCLUDED MATERIAL

The following materials must not be present in wastes consigned to Studsvik:

- Non-metallic materials such as rubber, plastic, or other organic materials
- Free liquids (no liquids of any kind are permissible)
- Cans of paint, grease, aerosols, or other organic materials
- Toxic materials
- Materials that may cause explosion or self-ignition
- Zinc-galvanized metals or any other metals not listed as acceptable for treatment
- Cables containing tensioning wires
- Other materials not meeting the Conditions for Acceptance for the Low Level Waste Repository.

Studsvik reserves the right to return excluded materials to the consignor without treatment.

PACKAGING REQUIREMENTS

Studsvik can accept wastes packaged within full height, half height or third height ISO containers.

All loading and restraining should be in accordance with the relevant transport regulations. Acceptable sub-packaging includes metal boxes, crates, drums or plastic wrapping.

Packaging and loading should be approved by Studsvik prior to dispatch to enable the safe and efficient unloading at the facility.

Packaging can be provided by the customer or by Studsvik as part of the agreed service. Customer-supplied packaging will be made available for collection following receipt and unloading of the container at MRF.

The packaging and transportation of large components which are not packaged in ISO containers should be agreed in consultation with Studsvik.

INTRODUCTION TO TREATABILITY MODEL

For metallic LLW falling outside the Normal Operating Parameters, a Treatability Model is utilised to investigate and identify the optimum form of treatment.

The Treatability Model is managed by our consignor support personnel and technical staff providing an interface with the consignor to ensure the waste is accurately assessed and assigned to the appropriate treatment process lifecycle.

The level of treatability of metallic waste not meeting Normal Operating Parameters is dependent on one or more of the following factors:

- Dose rate constraints and ALARP principles at all Studsvik facilities
- Radionuclide fingerprint and specific activity
- Size of items for waste that cannot be transported in standard containers
- Thickness of material for blasting processes
- Coating on metals
- Secondary waste generation and its classification
- Enrichment of uranium and other fissile nuclides
- Specific details of complex assemblies
- Compliance with Conditions for Acceptance at the UK Low Level Waste Repository

Studsvik's vast operational experience, database and extensive on-going research and development in the area of metals recycling can efficiently provide the optimum treatment route for a wide variety of waste characteristics.

Studsvik can treat items with dose rates in excess of the Normal Operating Parameters by utilisation of shielded cutting and treatment facilities at MRF and Studsvik Sweden. Assessment of treatability will be made by Health Physics professionals at our facilities. Studsvik will assess the radionuclide fingerprint and specific activity of wastes outside the Normal Operating Parameters to assess the likelihood of release of the material from regulatory control after treatment, as well as the classification of any secondary wastes generated that will require disposal.

Studsvik utilise the RSA93 Exemption Orders for controlled release of waste processed in the UK and European Commission report Radiation Protection 89 (Recommended radiological protection criteria for the recycling of metals from the dismantling of nuclear installations) for wastes treated in Sweden. This assessment step will consider the fate of each nuclide in the treatment process and the requirements to achieve controlled release of the treated metals.

Wastes with any significant level of activation may be treatable but will require prior assessment via this step, as are wastes with enrichment of uranium or other fissile nuclides.

Large or heavy items up to 500 tonnes can be processed by Studsvik at our facility in Sweden, subject to prior assessment. Typically these items might include tanks, vessels and steam generators.

Studsvik will consider the overall processing arrangements to develop a treatment concept for the wastes.

Material of thickness less than 3 mm requires assessment to determine treatability, as the effectiveness of our blasting processes need to be carefully considered when processing thin material.

Studsvik can potentially treat complex assemblies and machinery such as motors and pumps following an assessment of the item to determine the working time required and net benefits of their disassembly. Wastes out with the activity limits prescribed in our Normal Operating Parameters may have the potential to generate secondary wastes that cannot be disposed to LLWR. In these cases, Studsvik will undertake a prior assessment of the characteristics of the secondary wastes produced to ensure that they can be suitably disposed of.

Further guidance on the treatability model can be found in Studsvik's 'Metal Treatment Service – Consignor Guidance' documentation.

OTHER REQUIREMENTS

Contractual Requirements

Under the contract for the customer owned waste service all secondary wastes, metal unsuitable for exemption or any non-conforming waste shall be returned to the customer following treatment. This includes any such wastes generated as a result of additional treatment at our Swedish melting facility (if required).

Should any waste delivered, either at the point of delivery or following unpackaging, be determined to be significantly outwith the WACs or as defined by the consignor, the waste(s) shall be transferred to the reject area of the facility and the consignor notified. In most instances a suitably compliant resolution shall be identified. Studsvik however reserve the right to return any non-compliant waste to the waste consignor if a suitable resolution cannot be agreed.

As such all wastes received and generated under this service must be either; suitable for treatment and exemption from Studsvik's waste treatment facilities; suitable for disposal at the LLWR; or returned to the customer.

Studsvik reserves the right to forward sections of the waste to our facilities in Sweden for additional treatment as necessary. In accordance with the operation of these facilities the waste owner shall also provide, at latest at the date of order, an Acceptance Guarantee for the return of secondary waste (and any other wastes generated during treatment that cannot be controlled released). A copy of the Acceptance Guarantee and an explanation are provided in Appendix 3.

Initial Enquiries and Delivery Information

In order to assess the suitability of the waste for treatment at Studsvik, either against the Normal Operating Parameters or Treatability Model, some upfront information is required from the consignor.

Studsvik Form 247 ("Application for Waste Treatment at the MRF") should be completed initially as this provides the fundamental data on which treatment can be assessed. Once received, together with any supplemental data, the waste stream shall be assessed against the Normal Operating Parameters and/or Treatability Model and either an acceptance in principle or request for additional information given. A copy of Form 247 is provided in Appendix 1.

Once all subsequent technical and commercial activities have been satisfactorily completed, a date for delivery shall be agreed between the consignor and Studsvik utilizing Studsvik Form 249. A copy of this Form is included in Appendix 2.

No waste will be accepted at the Studsvik MRF without prior approval from Studsvik UK.

Responsibilities for Shipment

Studsvik UK Limited can arrange transport, packaging and assist with the preparation of transport documentation. However, the consignor is legally responsible for the shipment of materials to Studsvik and for complying with all relevant legislation and for providing appropriate transport documentation.

All transportation of radioactive materials must comply with UK and European Dangerous Goods Transport legislation. Authorisation for shipment of waste to the Studsvik MRF is required under the Radioactive Substances Act,1993.

Any onward transport of the waste from the MRF to our Swedish facility for melting or other treatment shall be the responsibility of Studsvik UK as the consignor of the waste. Transport of all compliant residues back to the customer shall also be undertaken by Studsvik.

Return of Secondary Wastes

In accordance with the Guarantee for Acceptance of Returning Scrap Metal (Appendix 3), Ingots or wastes with an activity content exceeding the limits for controlled release after treatment at Studsvik are sent back to the consignor of the material together with the secondary waste (slag, cutting and blasting residues, dust from the ventilation filters and any material not meeting these Waste Acceptance Criteria). All waste returns to the consignor must be completed within 3 months of the consignor being notified by Studsvik UK that their wastes are available for return.

APPENDIX 1

Form 247: Application for Waste Treatment at the Metals Recycling Facility

APPENDIX 2

Form 249: Intent to Consign Waste to the MRF

APPENDIX 3

Waste Return Guarantee

Studsvik

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[Company/Org]
[Responsible officer]
[Customer's full address]

Waste returning guarantee regarding:
Metal Treatment of **[Waste]** Originating from **[Site]**

We hereby confirm that **[Company]** is the owner of all scrap metal included in this order, together with all secondary wastes generated from its processing such as blasting residues, cutting residues, filter dusts, slag and any waste dispatched that does not comply with the Waste Acceptance Criteria. This also includes any ingots generated from the melting process, and temporarily stored at Studsvik, for decay in order to reach valid controlled release levels.

We hereby accept that, within 3 (three) months of being notified by Studsvik UK , we will receive secondary waste - processed from our own material - like slag, cutting residues, filter dusts and material not meeting the Waste Acceptance Criteria as well as any metal that does not meet valid exempt waste criteria in either the UK or Sweden.

Moreover we take notice of the fact that, on our own, or the Swedish or UK authorities', demand, any material in decay storage at Studsvik Nuclear AB may be returned at any time to the UK.

[Company] will always provide means for the return of such secondary waste.

Firstly, there are sufficient financial reserves for the return of any ingots and waste from Sweden to the UK and its storage within the UK.

Secondly, we will always provide the license and technical support necessary for return of such residues.

For any ingots in storage Studsvik Nuclear AB will take over the ownership after the approval from the relevant Swedish authority (SSM) for subsequent clearance (release) under the Swedish nuclear license.

Date:

Signed:

Position:

Company:

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Explanation to the Waste Return Acceptance Guarantee

The Studsvik MRF has been designed to provide the UK with a decontamination facility for metallic waste with the goal of reducing the volume of LLW disposed of at the LLWR as far as practically possible. Although the target is to deliver this goal through exemption of metal within the UK, metallic LLW consigned to the Studsvik MRF may also benefit from additional treatment at the Studsvik facility in Sweden in order to maximise the volumes that can be recycled. Shipment of metallic LLW between Studsvik's UK and Swedish facilities shall be the responsibility of Studsvik UK and will be subject to an approved TFS authorisation from the Environment Agency.

Scrap metal from the UK MRF will be transported by an authorised transport company to Studsvik's treatment facilities in Sweden. As soon as the material is received at the licensed site in Sweden all handling of the material takes place under the licences of Studsvik Nuclear AB. The licences cover transport, handling, melting, and temporary storage of the material. Under the customer owned waste service the originator (initial consignee) of the material is always the owner of the material whilst it is at the Studsvik facilities and, if relevant to scrap metal, also during any decay storage at Studsvik.

Ownership and Licence

These licences imply that Studsvik may at any time return the material, or parts of it, to the original licensee. This covers radioactive waste such as the blasting residues, filter dust, slag from melting or resultant ingots produced, as well as any material not meeting the Waste Acceptance Criteria from the treatment at Studsvik. Furthermore, the customer's authorities may at any time, due to unforeseen changes in legislation, request the returning of the ingots /ashes/ and other secondary waste to the owner.

Secondary wastes produced (as defined above) as a result of either treatment at the Studsvik MRF or our facilities in Sweden must be returned to the waste owner within 3 months of them being notified by Studsvik UK. This must be agreed with the consignor in advance of any works being undertaken to ensure that the relevant requirements of both the Swedish and MRF site licenses can be efficiently and compliantly managed.

After treatment Studsvik undertakes the controlled release of the treated material, and at the same time, takes title to the materials which have reached valid exempt waste criteria in either the UK or Sweden. At any time prior to release, including any decay storage period, the customer has the full responsibility as the owner of the delivered scrap metal until a change of ownership has been completed.

Long Term Liability

As explained above, the site licensee will remain the owner until controlled release has been completed, and may be required to take-back some or all of the material.

For this purpose Studsvik needs a declaration from the licensee (owner) that the owner is prepared to take back the material at any time.