6.0 Treatment of WEEE

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Audience: This section of the guidance is particularly aimed at treatment facilities, however other organisations such as PCSs and DCFs / sources of WEEE can also benefit from it as it describes the systems and procedures which are undertaken in the treatment of WEEE.

Benefits: The benefit of implementing this guidance is that it provides treatment facilities with processes they can implement to help improve the quality of WEEE derived materials they produce. It also helps identify options for improving the traceability of WEEE when passed to downstream treatment facilities.

Summary: This section of the guidance provides good practice initiatives which can be implemented to improve the collection and treatment of WEEE. It also provides options for improving the traceability of WEEE when sent to downstream facilities and ensures that the WEEE is treated in a manner acceptable to the treatment facility.

6.1 Collection of WEEE

A treatment facility may perform the collection of the material from a variety of different locations such as DCF sites, businesses and retailers. WEEE collections can be made directly by the treatment facility waste haulier or by a compliance scheme requesting a collection. In addition, treatment facilities can subcontract haulage companies to deliver the collection service on their behalf. When they procure the services of a haulage company they must ensure that they are appropriately licensed and fully understand the service requirements [see Health and Safety and Environmental Procedures sections 4 and 5]. These can include details of WEEE source, type, schedule of collection and any other requirements.

Treatment facilities that collect WEEE typically try to maximise the quantity of WEEE they collect at any one pick up and implement collection routes which best accomplish this aim. They also try to ensure that contamination is kept to a minimum and, as far as possible, try to prevent risks from potentially hazardous items such as gas cylinders, petrol lawnmowers, batteries, syringes and vacuum cleaner bags (as with all treatment facilities). Depending on the technology used for treating the WEEE, these items can potentially damage the equipment and pose significant risks to the H&S of staff.
Good practice

Good practice for the collection of WEEE involves the safe collection methods whilst maximising the load and minimising contamination. Examples of good practice include:

- providing treatment facility customers (DCFs, retailers, business etc) with information packs, advising them on how best to store and handle WEEE (including for reuse);
- establishing direct working links between the treatment facility and the DCFs / sources of WEEE in order to facilitate a quick and efficient collection service. This also helps resolve issues when they arise. However it should be noted that some PCSs do not allow this direct link for operational reasons;
- implementing a collection booking system which allows for site specific instructions to be given to the collection staff. This can ensure staff have site specific information which can assist them on site and helps in the resolution of any operational and collection issues;
- scheduling of collections from sites is important to ensure that collection vehicles are not going onto site at their busiest times or conflicting with other collections;
- ensuring treatment facilities put in place Service Level Agreements with their subcontractors such as haulage companies to ensure that there is complete visibility and understanding of the services required. The benefits of this is that it allows both parties to have a clear understanding of what is required of each party, which helps the smooth delivery of the service; and
- checking for contamination and potentially hazardous items (gas cylinders, petrol lawnmowers, batteries, syringes and vacuum cleaner bags) at the earliest possible opportunity. These checks should be repeated throughout the collection and processing chain to avoid risks from hazardous items, which reduces risks to H&S and equipment.

Key benefit of taking action

WEEE should be checked for potentially hazardous items (gas cylinders, petrol lawnmowers, batteries, syringes and vacuum cleaner bags) at the earliest possible opportunity. These checks should be repeated throughout the collection and processing chain to avoid risks from hazardous items. Checking for these items can help prevent the risk of an incident during WEEE treatment.
EXAMPLE:

S. Norton & Co. Ltd: Benefits from Liaising Direct with Source

S Norton & Co Ltd is an AATF and AE for treating LDAs and Small Mixed WEEE. They operate a batch process which specialises in the segregation of metals and plastics.

Although they work with a number of producer compliance schemes they state that when they are permitted to have direct lines of communication with their sources, such as DCF sites, it allows for a better and more efficient working relationship. It also helps to educate staff on site on how to identify and handle potentially hazardous items.

S Norton & Co Ltd demonstrate good practice by informing sources of when hazardous items such as gas cylinders are found and try to educate them to identify and remove them at source to prevent any potential accidents occurring at the treatment facility.

The figure above shows the steel container where gas cylinders are stored on site until removal by a specialist treatment organisation.

S Norton & Co Ltd work in close partnership with their sources such as DCF sites and when items such as gas cylinders are found in the WEEE, they segregate the items on site for removal by either the brand manufacturers or by specialist treatment organisations. This helps demonstrate their Duty of Care and ensures that the items are treated appropriately rather than returning it to the source where the operators may not be as experienced in handling such items.

The benefits of this are that they can work together to reduce the number of potentially hazardous items entering their site, whilst strengthening client relations and ensuring these items are treated or disposed of in a safe and environmentally sound manner.
6.2 WEEE treated at treatment facility

The treatment of WEEE varies according to each category of WEEE and the technology that is used. Some treatment facilities utilise large-scale shredding technologies, whilst others use a disassembly process, which can be either manual or automated.

For disassembly operations, treatment facilities should comply with the minimum requirement specified in the WEEE Directive (Annex II) and BATTRT guidance (See Health and Safety and Environmental Procedures), for the removal of certain substances and components:

- batteries;
- toner cartridges;
- plastics containing brominated flame retardants (BFRs);
- asbestos;
- cathode ray tubes (CRTs);
- gas discharge lamps;
- external electrical cables;
- printed circuit boards of mobile phones greater than 10 cm; and
- components containing mercury such as switches or backlighting lamps.

For shredding operations, treatment facilities may not be required to remove these components and substances. This is dependent on the size and type of technology used, although some hazardous components and substances must be removed in advance to avoid risks to H&S and damage to equipment. The removal of hazardous streams should be recorded.

Good practice

Good practice in the treatment of WEEE involves the checking and removal of potentially hazardous items, treating the WEEE and sending the remaining WEEE or WEEE derived materials for further treatment or recycling. Examples considered to be good practice which treatment facilities should consider implementing include:

- ensuring that for any WEEE which requires further treatment, the treatment is carried out by an ATF. By doing this, the treatment facility can ensure that evidence can be correctly raised on the material. The benefit of this is that it ensures WEEE is treated by a treatment facility which is audited by the relevant environmental agency (See Traceability & Management Systems section);
- implementing a process for staff on how to safely identify and remove any hazardous items. For example, hazardous items should be put in a suitable container, clearly marked and stored until disposal or sent for further treatment. The treatment facility should document the occurrence and report back to the source to help reduce the risk reoccurring; and
- focussing on the production of high quality WEEE derived materials at treatment facilities. By doing this the quantity of WEEE recycled can be optimised, whilst increasing the potential net value recovered from the materials.
EXAMPLE:

Reclaimed Appliances Ltd: Disassembly Process

Reclaimed Appliances Ltd are an AATF and AE. However, they also refurbish items for reuse which are sold complete with a warranty, in Reclaimed Appliance’s own shop and in a number of other retail outlets in the UK.

Their process involves an initial assessment phase to identify any potential items for reuse, and then the non-reusable items go through manual disassembly for all categories of WEEE, with the exception of gas discharge lamps. By treating the WEEE this way they aim to optimise the number of items for reuse as well as maximise the level of recycling when the item is not fit for reuse.

All components and substances are removed according to the WEEE Regulations and BATRRT guidance.

The process means that the WEEE derived materials produced, such as plastics, tend to be good quality with limited contamination. It can also be easily replicated by other treatment facilities.

When items are selected for reuse rigorous tests are conducted to ensure they are safe to use and in good working condition. Components and parts are also recovered for reuse.
6.3 WEEE sent for further treatment in the UK

In some cases treatment facilities may only part-treat WEEE they receive and then send the WEEE onto other treatment facilities to complete the treatment process. An example of this could be that a treatment facility collects several categories of WEEE but sends refrigerators onto a specialist refrigerator treatment plant. Further treatment can be carried out by other treatment facilities, which may be AATFs in their own right.

However, when this is required, treatment facilities should have a number of good practice initiatives in place to ensure that they are working with ATFs that treat the material in a manner that is acceptable to them. Initiatives considered good practice which should be considered by treatment facilities include:

- ensuring that for any obligated WEEE which requires further treatment, the treatment is carried out by an ATF and, further down the chain, an AE (if applicable). By doing this, the treatment facility can ensure that evidence can be correctly raised on the material;

- issuing a letter or contract to downstream ATFs / AEs on how the treatment facility expects downstream operators to treat their WEEE (See Reuse section) and WEEE derived materials, including final destination routes. The letter or contract should also request proof of compliance with the treatment requirements. This could include permits, mass balance or proof of sale;

- requesting supporting evidence from downstream treatment facilities of the efficiency of their operation and or percentage of WEEE recycled. This can help improve the accuracy of the reported level of WEEE recycled, in addition to creating an audit trail to avoid ‘double counting’ of evidence raising;

- site visits and auditing of the downstream treatment facilities and end markets should be conducted where practical. The benefits of this are that it allows the facility to ensure they are working with reputable companies that are handling the material and or items in an acceptable manner; and

- working with a manageable number of treatment or reuse organisations only. This ensures that the treatment facility can implement traceability systems and conduct audits on their supply chain to ensure that they are treating the WEEE in a manner acceptable to the treatment facility.

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6.4 Quality control

A treatment facility should ultimately try to maximise the quality of WEEE derived materials they produce. This will be dependant on the quality of WEEE they receive and the technology and processes they have in place for treating the WEEE.

A treatment facility will often perform the collection of WEEE from different sources. It is at this stage that the first quality check on WEEE should be performed. This initial check allows the staff to identify and remove any contamination and items which can pose a hazard.

Once the WEEE is treated the treatment facility will usually sell the WEEE derived materials to end markets offering the best price or service (collects on time, provides accurate reports and complies with the Regulations). However, the price paid is often dependant on the quality of the material and as such, treatment facilities will try to maximise the quality of the WEEE derived material streams they produce.

**Good practice**

Examples of good practice can be demonstrated by making checks on the final processing activity and end destination to identify what ultimately happens to the WEEE derived materials. Initiatives considered good practice for improving quality include:

- focussing on producing high quality WEEE derived materials. By doing this facilities can ensure they optimise the quantity recycled as well as the value of the resultant materials. Focussing on producing high value WEEE derived materials rather than simply trying to sell whatever the process produces helps improve the value recovered from the WEEE;
- undertaking appropriate checks to identify the quantity and quality of WEEE received from each source. This will allow the treatment facilities to implement appropriate quality control measures such as segregating of loads pre-sorting to remove items which can affect the quality of end products;
- conducting further checks along the processing line to further identify and remove contamination as well as items which pose a hazard;
- implementing a system to test the treated WEEE derived materials for quality control (where appropriate). Samples should be taken and a composition analysis conducted to identify the purity of the material and level of contamination;
- identifying problematic sites where the quality of WEEE received is poor is important. The benefits of this are that it allows the treatment facility to suggest and implement improvements based on good practice initiatives identified at other similar sites; and
- requesting feedback from end markets regarding the quality of material produced by the treatment facility. This feedback may include suggestions on how to improve the quality and potential value of the WEEE derived materials.

**EXAMPLE:**

**MDJ Light Brothers Ltd: Producing High Quality WEEE Derived Materials**

MDJ Light Brothers Ltd is an AATF which focuses on producing high value WEEE derived materials from their processes, as well as optimising their recycling levels.

Their aim is to produce materials which are of a high value and good quality rather than aiming to recycle the material at the lowest cost. They then seek to optimise the value they can recover from the derived materials.

They use a dismantling process to ensure the optimum separation of recoverable materials (as well as Annex II listed items) and then the materials are put through various automated treatment processes to maximise contamination removal and refine the finished WEEE derived materials. They aim to meet high quality end market specifications, which, although more costly than some other treatment systems, does help their materials obtain a better end value which offsets the additional costs.
6.5 Protocols

Defra has developed and published protocols for LDAs and Small (mixed) WEEE. Treatment facilities may either use the Defra protocols or can develop their own protocol, which must be approved by the relevant authority (EA, SEPA or NIEA) when applying for the AATF permit or during a compliance year (in advance of using the protocol). Protocols help to facilitate the auditing, tracking and reporting processes, and good practice in using protocols is aimed at having a system which applies the protocol in an understandable, easy to use and auditable format.

The protocols estimate the percentage of each WEEE category in a load (in the case of small (mixed) WEEE) and also allow for the estimation of the percentage split by material (e.g. plastics, metals and printed circuit boards).

**Good practice**

Examples of good practice in using protocols which should be considered include:

- implementing an electronic system which automatically applies protocols to WEEE arriving on site (this could be the Defra protocols or the protocols developed by the treatment facilities). This is useful for managing the material and providing an audit trail. It also allows for the organisation to quickly identify the quantity of WEEE derived materials for which they will require end markets; and
- using hard copy systems when electronic systems are not available. The format used for both electronic and hard copies should be transparent and simple to understand and allow for easy auditing.

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6.2 WEEE Treated at Treatment Facility

6.3 WEEE Sent for Further Treatment in the UK

6.4 Quality Control

6.5 Protocols

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