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Standard Operating Procedure(SOP) for Recycling of Lead Scrap/ Used Lead Acid Batteries

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Central Pollution Control Board

(Ministry of Environment, Forest & Climate Change, Government of India)

Parivesh Bhawan, East Arjun Nagar, Shahdara, Delhi – 110032

STANDARD OPERATING PROCEDURES

for

Recycling of Lead Scrap/ Used Lead Acid Batteries such as Lead Acid Battery plates, Rains, Rinks, Radio, Racks, Rakes, Ropes, Rono, Rents, Relay, Rails and other Lead Scrap/Ashes/Residues etc.

1. Requirements for seeking permission for import of Lead Scrap/ Used Lead Acid Batteries for recycling

1.1.1 Any Unit desirous of importing lead scrap/ used lead acid batteries should have valid authorization from the concerned SPCB/PCC under Hazardous and Other Waste (Management &Transboundary Movement) Rules, 2016. The requirement (pertaining to recycling facilities and standard operating procedures) for grant of authorization to such Units are given in this SOP at **Annexure-I**;

1.1.2 Import of the used lead batteries should be done in pallets and it should be either stretch wrapped or shrink wrapped to the full height of the pallet stack and should be air tight to avoid any gas within the pallets. The wrapping should be abrasion and pierce resistant The pallets used should have sufficient weight bearing capacity and impact resistance. The pallet should be leak-proof and should be labelled as acid containing material;

1.1.3 Imported used lead acid batteries should have the caps of cells properly tightened in place at the time of transportation.

1.1.4 For considering applications for import of lead scrap/ used lead acid batteries, the following are also required along with filled up application in Form-5:

i. Valid Consent to Establish (CTE), Consent to Operate (CTO) under Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act 1981;
ii. The analysis reports of stack emissions, waste waters, ambient air, work zone environment, soil and ground water specially in respect of lead content;
iii. The latest blood analysis report in respect of blood lead level of workers engaged in the Unit from accredited laboratories;
iv. Justification notes for import of lead scrap/ used lead acid batteries;
v. Geotagged photographs & geotagged video of running plant and facilities including pollution control devices;
vi. Acknowledgement for receipt of copy of application from concerned State Pollution Control Board (SPCB) / Pollution Control Committee (PCC);

1.1.4 In addition to the above, those desirous of importing used lead acid batteries (Rains & Rinks) have to fulfil the following requirements:

i. Should have registration on the EPR Portal under Battery Waste Management Rules, 2022;
ii. Should have registration on the EPR Portal under Plastic Waste Management Rules,2016 and amendments thereof;

iii. Should have automatic battery breaking system having acoustic enclosure, dust and fume extraction system as well as wet separation system for lead and plastic;
iv. Should have mechanical facility for draining the acid from batteries into the acid collection tank; and
v. Should have rotary furnace with air pollution control system.

Annexure-I.

STANDARD OPERATING PROCEDURES
Recycling of Lead Scrap/ Used Lead Acid Batteries

1. Grant of Authorization by SPCBs/PCCs

1.1.1 Any person who desires to set up a recycling Unit for recycling of lead bearing waste such as scrap/used lead acid batteries, Lead acid battery plates, Radio, Racks, Rains, Rinks, Rakes, Ropes, Rono, Rents, Relay, Rails and other lead scrap/ashes/residues etc. should submit an application in Form1 of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, accompanied with copies of the following documents for the grant of the authorization to concerned SPCB/ PCC.

i. Consent to establish granted by the State Pollution Control Board under the Water (Prevention and Control of Pollution) Act, 1974 (25 of 1974) and the Air (Prevention and Control of Pollution) Act, 1981 (21 of 1981);

ii. Consent to operate granted by the State Pollution Control Board under the Water (Prevention and Control of Pollution) Act, 1974 (25 of 1974) and/or Air (Prevention and Control of Pollution) Act, 1981, (21 of 1981);

iii. In case of renewal of authorization, a self-certified compliance report in respect of effluent, emission standards and the conditions specified in the authorization for hazardous and other wastes;

iv. Process flow chart of recycling or reprocessing of lead scrap/ used lead acid battery scraps along with the details of equipment installed;

v. Proof of installed capacity of plant and machinery as per registration issued by District Industry Centre or any other authorized government agency.

vi. Membership of Treatment, Storage and Disposal Facility (TSDF) for final disposal of slag after recycling of lead bearing waste;

vii. Details of Air Pollution Control Systems (APCS) installed in the Unit along with the diagram and their specification;

viii. Details of Effluent Treatment Plant (ETP) for treatment of acidic waste water and discharge from scrubber;

ix. Details of on-site secured storage (covered) facility for slags generated during the recycling process;

x. Details of covered storage space having impervious fooring for storage of raw material and finished products. Acid proof flooring in used batteries storage and breaking areas.

1.1.2 After receiving the application, the designated officer/officers should examine it and the shortcomings if any be communicated to the applicant within 7 working days of receiving the application;

1.1.3 After obtaining the required information /documents from the applicant, a dry inspection has to be carried out by the concerned SPCB/PCC for verification of the installed facilities. In the inspection report, the inspecting officer/officers shall certify that he has seen the recycling facility and also shall detail out the pollution control equipment installed in the recycling Unit and put his signature;

1.1.4 On the basis of inspection report the SPCB/ PCC, after being satisfied that the applicant is having environmentally sound technology, requisite technical capabilities, adequate facilities & equipment, shall grant authorization. If required, the SPCB/PCC at their discretion may constitute a committee to examine the proposals seeking authorization and to recommend for grant of authorization;

1.1.5 The authorization Certificate shall be granted by the State Pollution Control Board/ Pollution Control Committee along with a Passbook;

1.1.6 The authorization issued is valid for a period of five years, unless the operation is discontinued by the Unit or the authorization is suspended or cancelled for any violation of rules/conditions specified in authorization certificate;

1.1.7 SPCBs/PCCs is expected to dispose applications for authorization as stipulated in the HoW(M&TM) Rules 2016 within a period of six months from the date of receiving application completed in all respect. SPCBs/PCCs shall carry out performance evaluation of the pollution control devices including ETP for assessing adequacy (meaning whether capable of controlling pollution or not) of pollution control equipment. The inspection report has to be certified by the inspecting officer/officers that he has seen all the pollution control devices which are part of APCS and ETP in running condition and the devices & ETP are capable of controlling pollution; and

1.1.8 The list of the authorized recyclers or re-processors should be regularly updated and placed on the official website of the concerned SPCB/PCC. Statement of authorized recyclers in the State may be sent to CPCB on yearly basis by all the SPCBs/PCCs to maintain a centralized list of such recyclers in the country at CPCB website.

1.1.9 SPCBs/PCCs to ensure that the vehicles designated for transportation of used lead acid batteries (Rains & Rinks) should meet the criteria laid down at section 5 of this SOP and should enter the vehicle registration number in the respective authorization after satisfying themselves that the vehicle meets the laid down criteria.

2. Minimum required facilities, operating procedures

Type of furnace installed (Rotary/Mandir Bhatti)

a. Rotary furnace with suction hood connected with APCS over the charging point exists.

b. Mandir Bhatti with suction hood connected with APCS over the charging point and molten metal tapping point exists.

2.1.1 Furnace connected with expansion chamber, cooling tubes/ducts, Cyclone/ Multi Cyclone, Bag filter with pulse jet/ mechanical shaker arrangement, Alkaline Scrubber with arrangement of alkali dosing, & connected with ETP, ID fan and stack of minimum 30-meter height. Each stack should have a port- hole (as per specifications given in CPCB document COINDS-III) with platform for stack monitoring. There should be an easy ladder for safe access to stack monitoring platform;

2.1.2 Battery–Breaking Processes: After draining the acid there are two modes of braking of batteries before battery plates are processed for smelting. The first mode is manual where the battery is cut from top, plates are removed and left over acid is drained. The second mode is where the battery is mechanically broken along with casing;

2.1.3 The facilities required for manual dismantling include suction hood, connected to pollution control device, arrangement for washing of plastic components before being sent for recycling and acidic water neutralization facility. All the facilities with capacity more than 5000 MTA should install mechanical/automatic battery breaking Units;

2.1.4 The Unit should have separate covered storage space, having impervious acid proof flooring with acid collection tank connected with neutralization tank, for storage of used/waste lead acid battery. The acid collection tank should have arrangements for control of acid fumes such as fume arrester connected with APCS;

2.1.5 The Unit should have a ETP plant to treat waste water from battery-breaking system. The ETP should be based on physic-chemical treatment of waste water and should have provision for acid neutralization. After neutralizing the acid, for its disposal the Unit should follow the consent conditions. The acidic effluent from floor washing should be channelized into the neutralization tank;

2.1.6 The automatic battery breaking system will have arrangement for noise control in the form of acoustic enclosure, dust and fume extraction system, acid collection and neutralization facilities and ETP for treatment of lead and acidic wastewater;

2.1.7 The Unit should have adequate facilities for the collection and storage of ETP sludge. The sludge from the ETP plant should be stored in a covered sludge storage facility and sent to TSDF;

2.1.8 Unit should have separate, secured and covered space for storage of residue and slag generated from recycling of lead scrap/used lead acid batteries and maintain records of transfer of hazardous waste to TSDF; and

2.1.9 The pallets packaging material should be disposed only to TSDF.

3. SPCBs/PCCs may prescribe the following standards for Emission /Discharge for Lead

3.1.1 Lead in work area, NIOSH 8-hr avg (mg/ m^3): 0.05;

3.1.2 Lead in emission through stack (mg/ Nm^3)* :10.0 (already notified);

3.1.3 Lead in effluents (mg/ l) :0.10 (notified general standard);

3.1.4 Lead in factory premises near boundary wall 24-hr avg (µg/ m^3): 1.0;

(* Nm^3 -normal cubic meter)

3.1.5 Workers Blood lead levels: As a practice, all lead related Units should periodically examine their workers at least once in year for lead level in blood as well as urine. Persons with higher lead levels (greater than 42 µg /dl) should be shifted immediately to non-lead activity areas and given special medical treatment till the lead levels come back to acceptable level (10 µg/dl).

4. Steps to minimize fugitive emissions of Lead

4.1.1 The design of hood /fume collection system from the smelting/ refining operations (from metal tapping point, charging doors, furnace joints etc.) should be capable of collecting lead emissions and transfer to the air pollution control system;

4.1.2 The storage and handling of all the raw materials, intermediates and products should be in covered area/ shed having concrete floors and mechanized equipment should be used to handle these materials as far as possible;

4.1.3 The floors in the loading area should be kept wet through sprinklers to reduce the chances of lead particles/ dust getting airborne; and

4.1.4 Any water used for washing, rain water etc, should be collected through separate pits (to delink this from the regular drain) for removing metallic lead etc. and the pit should have fine screens for passage of clear water.

4.1.5 The movement of vehicles to the administrative /working /production areas should ensure that only the trucks /vehicles involved in the material handling/ transportation reach the work areas, and their tyres are washed before they leave these areas;

4.16 The Unit should have facilities for washing tyres of vehicle entering and going out of the recycling facility.

5. The minimum requirement for transportation of used lead acid batteries (Rains & Rinks)

The following are the requirements pertaining to the transportation of used lead acid batteries:

5.1.1 Vehicle used for transportation shall be in accordance with the provisions under the Motor Vehicles Act, 1988, and rules made there under;

5.1.2 Transporter shall possess requisite copies of the certificate (valid authorization obtained from the concerned SPCB/PCC for transportation of used lead acid batteries by the importer) for transportation of used lead batteries;

5.1.3 Transporter should have valid "Pollution Under Control Certificate" (PUCC) during the transportation of used lead acid batteries and shall be properly displayed;

5.1.4 Vehicle should be fitted with GPS.

5.1.5 Vehicle should be fitted with mechanical handling equipment such as pallet jack, pallet lift, pallet truck, lift gate etc. for safe handling of the wastes;

5.1.6 The vehicles involved in the material handling/transportation of pallet of batteries should be leakage-proof. The vehicles should be labelled with logo for carrying Hazardous waste material;

5.1.7 Name of the facility operator or the transporter, as the case may be, shall be displayed;

5.1.8 Emergency phone numbers and transport emergency (TREM) Card having details of characteristics of waste (type, properties, chemical constituents, exposure hazards and first aid requirements) shall be displayed properly. MSDS must be provided with each consignment;

5.1.9 Import of the used lead batteries should be done in pallets and it should be either stretch wrapped or shrink wrapped to the full height of the pallet stack and should be air tight to avoid any gas within the pallets. The wrapping should be abrasion and pierce resistant The pallets used should have sufficient weight bearing capacity and impact resistance. The pallet should be leak-proof and should be labelled as acid containing material;

5.1.8 Imported used lead acid batteries should have the caps of cells properly tightened in place at the time of transportation;

5.1.10 Used lead acid batteries scrap must be transported inside shock resistant and acid resistant sealed container in upright position due to the risk of leakage;

5.1.11 The containers must be well packed to the transport vehicle and should not be allowed to move while being transported. The containers have to be bound, shrink wrapped or stacked properly to avoid movement;

5.1.12 During the unpacking of pallets of batteries, the workers should be equipped with Personal Protective Equipment e.g., PPE kit, Eyeglasses, Mask, Rubber Gloves and Shoes. Also, emergency kits and arrangement have to be readily available. The containers with pallets of batteries must not be opened during its transportation from port to the recycling facilities. The containers with pallets of batteries must be allowed to unload only at the recycling facility;

5.1.13 Vehicle shall be fitted with roll-on / roll-off covers if the individual containers do not possess the same. Carrying of passengers is strictly prohibited and those associated with the waste haulers shall be permitted only in the cabin;

5.1.14 Transporter shall carry documents of manifest for the used lead acid batteries during transportation and follow the manifest system as per HoW (M & TM) Rules, 2016 and it should be registered in the National Hazardous Waste Tracking System whenever it is implemented;

5.1.15 Each vehicle shall carry first-aid kit, spill control equipment and fire extinguisher;

5.1.16 Hazardous Waste transport vehicle shall run only at a speed specified under Motor Vehicles Act in order to avoid any eventuality during the transportation of used lead acid batteries;

5.1.17 Educational qualification for the driver shall be as per Motor Vehicles Act, 1988, and rules made there under and preferably 10th pass. The driver of the transport vehicle shall have valid driving license for heavy vehicles from the State Road Transport Authority and shall have a minimum of five years of experience in transporting the chemicals;

5.1.18 Driver(s) shall be properly trained for handling emergency situations and safety aspects involved in the transportation of hazardous wastes;

5.1.19 The design of the trucks shall be such that there is no spillage during transportation;

5.1.20 The loading and unloading of used lead acid batteries should be done through mechanical means. The manual loading and unloading of used lead acid batteries are not allowed; and;

5.1.21 The vehicles used for transportation of the used lead acid batteries should be leak proof. The flooring of the containers should be having wood sawdust. The containers being used for transportation of batteries should not be used for other purposes.

6. Liability:

6.1.1 In case of environmental damages arising due to improper handling of battery wastes including accidental spillage during generation, storage, processing, handling, transportation and disposal, the occupier (sender or receiver, as the case may be) shall be liable to implement immediate response measures, environmental site assessment and remediation of contaminated soil / groundwater / sediment etc. as per the "Guidelines on Implementing Liabilities for Environmental Damages due to Handling & Disposal of Hazardous Wastes and Penalty" published by CPCB.

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