Environmental Standard Operating Procedures (ESOP)

**TITLE: ESOP 9.8 | MANAGEMENT AND STORAGE OF BATTERIES**

PURPOSE: This SOP establishes the management and storage requirements for batteries aboard MCB Camp Lejeune. Batteries are specifically regulated under the Federal RCRA regulations 40 CFR part 273.2 and part 266.G. However, many batteries may exhibit one or more of the characteristics of hazardous waste, including ignitability, corrosivity, reactivity, and or toxicity and require management as Universal Waste under RCRA.

APPLICABILITY: This SOP applies to all Marine Corps Base Camp Lejeune commands, tenant commands, contractors working aboard Camp Lejeune, Reserve Units and any other command that uses or stores batteries aboard Camp Lejeune. The management of batteries starts from the time a command either: (1) purchases batteries from the military supply system, or (2) purchases batteries from a vendor located outside of the military supply system. Whichever method is employed, the management requirements are the same. The types of batteries include but are not limited to the following: Alkaline, Gel-Cell, Lead-Acid, Lithium (all types), Magnesium, Mercury, Nickel-Cadmium, Nickel-Metal Hydride, Silver-Zinc, Wet Cell and Zinc.

RESPONSIBILITY: All personnel who manage and store batteries.

PROCEDURE:

1. General storage requirements for batteries in the shop.

a. All batteries should be stored in a cool, well-ventilated, dry storage area. If temperatures exceed 130 degrees Fahrenheit, dangerous vapors can be generated and some batteries will generate flammable or reactive gas.

b. Batteries should be protected against being crushed, damaged, punctured, or short-circuited. If batteries are damaged in any way, they shall be turned in to the HM Consolidation Site located at Bldg 977, Michael Road, or prepared for pick-up at the unit’s next scheduled curbside pick-up appointment by Environmental Management Division (EMD).

c. Do not smoke, eat or drink in battery storage areas. Smoking can ignite the dangerous vapors.

d. Batteries shall be stored separate from all other hazardous materials. Hazardous materials can interact with a venting battery and potentially cause an adverse reaction such as fire or explosion.

2. Communication Batteries Specific Management Practices.

a. All communication batteries will remain bagged & boxed until used.

b. Lithium batteries shall be segregated from any other batteries. Due to the reactivity of lithium batteries they shall be kept dry and stored away from water and high moisture sources.

c. All personnel who are responsible for battery management must attend EM101 training. Documentation of this training must be available for review during inspections.

d. The terminals on all communication batteries will be covered by unit personnel with electrical/duct tape to preclude an electrical dead short prior to disposal/ turn-in to EMD. The tape cannot cover any of the identifying markings on the battery.

e. Battery charging shall be conducted on a non-flammable surface and only in areas designated for charging.

f. Shelf/Service-Life Management. One of the most effective waste minimization programs is active life-cycle management of hazardous materials before they expire and become hazardous waste.

i. Communication batteries come from the manufacturer marked with either an expiration date or a manufacturer’s test date. A HMMS shelf/service-life inspection label from HMMS shall be placed on the container. As long as a battery remains in their original container (Case, Box) only one HMMS label is required for that container. In the event the batteries are removed from their original container for individual storage or distribution, a new shelf/service life label will be requested for each battery. The original HMMS shelf/service-life label serial number will be turned in and used as justification for new individual labels

ii. Quarterly inspections are conducted on all HM to determine adequate shelf/service-life. Units, who identify batteries that will reach their manufacturer’s test date or expiration date prior to the next quarterly inspection, shall contact their ECO in order to schedule a curbside pick-up appointment with EMD/RCRS turn-in.

3. Wet-Cell & Sealed Lead Acid Batteries – Specific Management Practices.

a. Upon receipt by the end user, wet cell batteries shall be filled with the electrolyte that accompanies the kit. Any excess electrolyte shall be turned in to EMD at the next available curbside pick-up appointment.

b. Refilling batteries with electrolyte is NOT AUTHORIZED.

c. Batteries shall be stacked no higher than 2 tiers high for storage due to the potential damage to the batteries.

d. Battery charging shall be conducted on a non-flammable surface and only in areas designated for charging.

e. Cracked battery cases, batteries missing filler caps or other damaged areas which may result in a release of acid will be sealed with silicone or other appropriate sealant, and placed into an appropriate container for transport. The battery shall not be comingled with other batteries and will be turned into EMD at the next scheduled curbside appointment.

4. Battery Turn-In Procedures.

a. Spent wet-cell batteries will be scheduled for curbside pick-up by EMD, RCRS and staged on pallets. Batteries shall not be stacked more than two high on the pallet, separated by a layer of plywood or thick/heavy cardboard, and shall be banded to avoid the battery load shifting during transport.

b. Communication batteries shall be placed in a Department of Transportation approved container for transport to EMD. All battery types should be segregated for transport.

c. Batteries shall not be placed into plastic bags prior to turn in.

d. All wing nuts, bolts, terminal ends/connectors will be removed from the battery post by unit personnel prior to loading/transport.

e. At no time will the Complete Discharge Device (CDD) be activated on lithium batteries.

f. Damaged batteries will be segregated from other batteries, and will be identified to EMD staff as damaged during the unit’s scheduled curbside pick-up appointment.

g. Single-use alkaline batteries such as AAA, AA, C, D and 9-volt batteries produced by manufactures like Energizer and Duracell as

well as less common and/or generic manufactures now fall below Federal and State hazardous waste standards. Regardless of these standards units requiring disposal of alkaline batteries will them in to the Hazardous Material Consolidation Site (Bldg 977) on their next scheduled turn in day or "Curb Side Service".

5. Spill Reporting and Response Requirements.

a. In the event that a wet cell/lead acid battery is damaged to the point of leaking, or the unit suspects a lithium battery is off-gassing, unit personnel should immediately call 911.

b. Spill reporting and response actions for damaged batteries must be included in the Unit Level Contingency Plan (ULCP). Plans will be made readily available to personnel at each battery storage area.

REFERENCES:

(a) MCO P5090.2A – Environmental Compliance and Protection Manual
(b) MCIEAST-MCB CAMLEJO 5090.9 Hazardous Material/Waste Management
(c) ESOP Hazardous Material Management Program

TRAINING: Unit personnel should be trained on all the provisions of this SOP. All personnel who are responsible for battery storage/management must have attended MCBCL EM101 training.

DEFINITIONS: Most battery types come in several different shapes and sizes, including A, AA, AAA, C, D, 6V, 9V, coin, or button shaped, and battery packs (a series of battery cells connected together and usually encased in plastic). Some batteries are hazardous to the environment and pose health and safety risks to those using them. The following is a list of battery types and their hazards:

Alkaline. The most widely used battery type; these batteries contain an electrolyte which is made up of either potassium hydroxide or sodium hydroxide. Both of these electrolytes are strong alkalis. If this electrolyte contacts skin or eyes it will cause severe chemical burns. These batteries are non-rechargeable.
Zinc. These batteries are non-recyclable. They do contain ammonium chloride and zinc chloride which is used as an electrolyte. Both of these electrolytes are considered corrosive.
Lead-Acid These large batteries are very corrosive and should be stored separate of all other hazardous materials. The battery

contains aqueous electrolyte, which is used as an electrolyte. The electrolyte content of these batteries is between 28 and 51 percent by weight.

Lithium. Lithium batteries include lithium-manganese dioxide, lithium- sulfur dioxide, and lithium thionyl chloride. Lithium-sulfur dioxide batteries contain pressurized sulfur dioxide gas and lithium-thionyl chloride batteries contain liquid thionyl chloride, which vaporizes readily upon exposure to air, both of which are highly toxic and reactive.

Magnesium. These batteries contain an electrolyte that is made up of magnesium bromide or magnesium perchlorate. These chemicals can emit highly toxic fumes when heated. If batteries show signs of leakage, proper eye and skin protection is recommended during handling.

Mercury. These batteries contain an electrolyte of either aqueous potassium hydroxide or sodium hydroxide. The core of the battery is made up of 20-50 percent mercury or mercuric oxide by weight. The electrolyte can cause the same adverse effects as alkaline batteries listed above.

Nickel-Cadmium. Also known as Ni-Cads, contain an electrolyte that is made up of an aqueous solution of potassium hydroxide. The battery cells typically contain 13-15 percent nickel by weight. The electrolyte solution is caustic solution and is capable of causing the same serious chemical burns as alkaline batteries.

Silver- Zinc. These batteries contain an electrolyte that is made from an aqueous solution of lithium chloride or zinc chloride and zinc sulfate. The electrolyte is a mild acid (20 to 30 percent by weight) and can cause serious chemical burns to the skin and eyes.

Nickel-Metal Hydride. These batteries are usually are rechargeable.

Wet-Cell. This type of battery usually contains some sort of acid or caustic to use as an electrolyte. A wet–cell battery requires the user to “top off” the battery to gain its charge back. Some types of wet-cell batteries are non-refillable, and if heated or cracked will leak their respective electrolytes. The dangers of these can burns or severe skin irritation. These electrolytes can be either strong caustic or strong acids, depending on the battery type and manufacturer.

Gel-Cell batteries. Gel-cell batteries use a gel that replaces the standard acid that typically is found in lead acid or wet-cell batteries. The batteries are still turned in to EMD with a one for one exchange policy.

Motorola radio batteries. Handled the same as Ni-Cads.

**DOCUMENT OWNER:**_____

Record of Revision to the *SOP Management of Batteries*

| **Revision Number** | **Date** | **Summary of Change** | **Signature** |
|---|---|---|---|
| INITIAL DISTRIBUTION | 01242006 | DISTRIBUTED UNDER POLICY LETTER TO DISTRIBUTION A | PH RAPER, ECB/EMD |
| UPDATE | 06012014 | UPDATE FORMATTING AND CONTENT | S.J. AZOK, ECB/EMD |
| | | | |
| | | | |
| | | | |
| | | | |

- 