



DEPARTMENT OF THE ARMY
HEADQUARTERS, JOINT READINESS TRAINING CENTER AND FORT POLK
6661 WARRIOR TRAIL, BUILDING 350
FORT POLK, LOUISIANA 71459-5339

MAY 16 2016

AFZX-GL

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Command Policy Memorandum G4-04 – Joint Readiness Training Center (JRTC) and Fort Polk Battery Maintenance Management Program

1. References:

- a. Department of the Army (DA) Pamphlet 750-8, The Army Maintenance Management System (TAMMS), dated 22 August 2005.
- b. Technical Bulletin (TB) 906140-252-13, Recharging Procedures for Automotive Valve Regulated Lead-Acid (VRLA) Batteries, dated 31 January 2012.
- c. Army Regulation (AR) 750-1, Army Materiel Maintenance Policy, dated 12 September 2013.
- d. Forces Command (FORSCOM) OPORD 151298, FORSCOM Battery Maintenance Management Program.

2. Purpose. To provide installation level guidance in regards to the JRTC and Fort Polk Battery Maintenance Management Program (BMMP). This policy applies to all units on Fort Polk.

3. This policy is developed to provide policy guidance on the use and maintenance of military and commercial standard batteries and rechargeable and/or reusable batteries.

4. Responsibilities:

- a. Assistant Chief of Staff (ACoS), G4:
 - (1) Responsible for the overall supervision and management of the installation Battery Maintenance Management Program (BMMP).
 - (2) Submit the installation battery report to FORSCOM no later than the 10th of each month.
 - (3) Include the BMMP as part of the Command Maintenance Discipline Program (CMDP).

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b. Commanders and Activity Directors:

(1) Ensure all battery shops are operated in an Occupational Safety and Health Administration (OSHA) / Environmental Protection Agency (EPA) compliant manner.

(2) Appoint a primary and alternate battery maintenance manager to oversee the daily operation of the battery maintenance shop (enclosure 1).

(3) Establish a Battery Management Standard Operating Procedure (SOP) to support daily operations. See enclosure 2 for an example SOP.

(4) Ensure assigned personnel are competent on the basis of appropriate education, training, and/or experience to perform their assigned duties. TACOM training video can be viewed via AKO at: <http://www.army.mil/article/28860/tacom-battery-training-videos>.

(5) Ensure necessary equipment supplies and publications are identified and available to assigned personnel. This includes, but is not limited to, proper battery maintenance/charging equipment, appropriate personal protective equipment (PPE), spill equipment, technical manuals/bulletins, and policy memorandums.

(6) Overall responsible for compliance with instructions and procedures established for the battery maintenance shop.

(7) Incorporate the BMMP into their Command Maintenance Discipline Program (CMDP).

(8) Submit a battery utilization report to the G4 no later than the 5th of each month (enclosure 3).

(9) Ensure battery management training is incorporated in to the annual training plan.

c. Maintenance Management Personnel:

(1) Establish a Battery Management SOP IAW this directive. The SOP will provide guidelines and procedures for the unit's internal battery operations and will be subject to during the CMDP.

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(2) Use batteries prescribed by the equipment technical manual (TM). Maintenance free AGM/VRLA type batteries, will be used whenever possible to enhance readiness and reduce the JRTC and Fort Polk logistics and environmental footprints. Replace flooded (wet) lead-acid batteries with AGM/VRLA type batteries through attrition.

(3) Mission permitting, test batteries in the platform and make every attempts to charge without removing IAW TB 9-6140-252-13.

(4) Maintain maximum battery life expectancy by ensuring that the discharge levels do not fall below 50% or 12.2 Open Circuit Voltage (OCV) for AGM/VRLA batteries. Maintenance personnel will initiate a charge when the battery OCV is 12.6 or less. All batteries will be recharged to 100% capacity or 12.9 OCV for all AGM/VRLA batteries. Recharging the batteries at less than 100% will result in premature failure. Therefore, all batteries with an OCV of .01 will be charged for 72 hours.

(5) If determined necessary, remove AGM/VRLA battery from platform and take to the supporting maintenance facility for a "one for one" exchange.

(6) Turn-in all other battery types (non AGM/VRLA) IAW unit supported battery management shops.

(7) Permanently mark each battery casing, as stipulated in 40 CFR 273.14, with the words "**Used Battery**" and with the **date** the battery was determined to be unusable.

d. Battery Maintenance Facility Operators:

(1) Appointed by the unit commander per Appendix 4 to manage the battery shop. Duties include, but are not limited to, receiving, testing, recharging, maintaining, tracking, and re-issuing replacement batteries to unit personnel, or turning-in "unserviceable/condemned" AGM/VRLA batteries to the unit supported SSA for consolidation.

(2) Be competent on the basis of appropriate education, training, and/or experience to perform battery management duties as assigned.

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(3) Perform all battery maintenance, testing, charging, servicing, and replacements IAW TB 9-6140-252-13, OSHA Regulations (29 CFR 1910.178(g) and 29-CFR 1910.305(j)(7)), and other applicable safety guidelines.

(4) Maintain and use all assigned PPE and spill equipment IAW applicable safety guidelines.

(5) Maintain the AGM/VRLA battery recovery log.

(6) Keep AGM/VRLA batteries stored at the battery maintenance facility, connected to a battery maintainer to prevent sulfating and to ensure the batteries are fully charged before re-issuing.

(7) Test, determine condition, and tag batteries received with the appropriate condition code.

(8) Permanently mark each AGM/VRLA battery casing with the words “**Used Battery**” and with the **date** the battery was determined to be unrecoverable.

(9) Duct tape exposed battery terminals to prevent external short circuiting and stack used batteries on pallets IAW paragraph 14 below.

(10) Prepare a DA Form 2404 for batteries that are red tagged and classified as unrecoverable. Multiple batteries can be listed on the DA 2404 form, provided that each battery is identified by its unique serial number on the form.

(11) Turn-in unserviceable/condemned batteries to the unit’s supporting SSA along with the DA 2404. Unserviceable/condemned batteries must have the DD1577 attached.

(12) Maintain a Material Safety Data Sheet (MSDS) for each type of battery stored and managed at the battery shop.

(13) Maintain current copies of all applicable reference publications, technical bulletins, manuals, and policy memorandums on-site.

(14) Establish and maintain a Battery Management SOP IAW this directive. The SOP will provide guidelines and procedures for the unit’s internal battery operations and will be subject inspection to during the CMDP.

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e. Supply Support Activity (SSA):

(1) SSAs will not accept AGM/VRLA batteries unless red tagged with a DD Form 1577 and unless each battery casing is permanently marked, as stipulated in 40 CFR 273.14, with the words "used battery" and with the date and unit the battery was determined to be unrecoverable.

(2) Consolidate unserviceable/condemned AGM/VRLA batteries turned-in by the supporting units.

(3) Maintain a Universal Waste Collection Log for all battery types (flooded lead-acid, AGM/VRLA, lithium, etc.).

(4) Perform serviceability checks on all batteries before acceptance using a 490 PT series battery analyzer.

(5) Secure all used batteries to the pallet with stretch wrap.

(6) Turn-in unserviceable batteries to an approved battery reclamation and disposal facility.

(7) Monitor demands for each battery NSN and provide demand analysis report on a monthly/quarterly basis to the G4.

(8) Coordinate with the Directorate of Public Works (DPW) Environmental Services for pickup of unserviceable batteries, as required. Turn-in marked and red-tagged batteries along with the DA Form 2401.

f. Directorate of Public Works, Environmental Division:

(1) Provide assistance implementing, improving, and maintaining units/organizations battery management programs.

(2) Monitor units/organizations battery management program, recovery successes, procurement and disposal cost avoidance, and make recommendations for improvement as necessary.

(3) Coordinate and assist units/organizations with on-site battery maintenance and management training as necessary.

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5. Battery Charging Facility Requirements:

- a. Maintain current MSDS for each type of battery being serviced at the facility.
- b. Battery charging room must be well-ventilated with impervious surfaces and adequate containment in the event of spills.
- c. Signs prohibiting smoking or the use of open flames, sparks, or other devices used as igniting sources will be displayed at the facility.
- d. Emergency shower must be available, inspected, and maintained in good operating condition.
- f. Non-combustible dry sweep, absorbent materials, and spill control equipment will be kept on hand in the event of a spill. Even if AGM/VRLA are non-spillable lead-acid batteries, and are not expected to leak or spill, caution must still be exercised when handling this type of battery.

6. The point of contact for this policy memorandum is the ACoS, G4, Maintenance Management Office at (337) 531-2554.



GARY M. BRITO
Brigadier General, USA
Commanding

3 Encls

1. Example Appointment Order
2. Example SOP
3. Battery Utilization Report

DISTRIBUTION: A+

OFFICE SYMBOL (MARKS NO.)

DATE

MEMORANDUM FOR RECORD

SUBJECT: Duty Appointment for (input unit and location).

1. Effective (input date), the following personnel are appointed as the Battery Maintenance Facility Operators for (input unit).

NAME

RANK

PHONE NUMBER

2. Authority. TB 9-6140-252-13 and ACoS, G4, Command Policy 4, Battery Maintenance Management Program (BMMP)

3. Purpose.

a. To perform AGM/VLRA battery maintenance, testing, charging, tracking, servicing and re-issuing battery replacements to (input unit) Unit personnel.

b. To ascertain AGM/VLRA battery condition codes, prepare red tag (DD Form 1577) and DA Form 2404 and turn-in "unserviceable/condemned" AGM/VRLA batteries to the (input unit) Unit SSA for consolidation and subsequent turn-in.

4. Period. Until officially released from appointment or reassigned.

5. Special Instructions. The appointed personnel will perform all AGM/VLRA battery management duties in accordance with TB 9-6140-252-13 and ACoS, G4, Command Policy 4, Battery Maintenance Management Program (BMMP). Appointed personnel will be competent on the basis of appropriate education, training, and/or experience to perform battery management duties as assigned, and remain informed of most current reference documents applicable to their duties.

6. Point of contact

Signed by Co CDR

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SUBJECT: Battery Management SOP

1. References.

- a. Department of the Army (DA) Pamphlet 750-8, The Army Maintenance Management System (TAMMS) User's Manual, 22 Aug 05.
- b. Army Regulation (AR) 750-1, Army Materiel Maintenance Policy, 20 Sep 07.
- c. TB 43-0134, Battery Disposition and Disposal, 19 May 08.
- d. TB 9-6140-252-13, Recharging Procedures for Automotive Valve Regulated Lead-Acid Batteries, 22 Sep 11.
- e. FORSCOM message, dated 22 Dec 15, Subject: CORPS and MSC Tasked ISO Battery Maintenance Management.
- f. The JRTC and Fort Polk Command Policy Memorandum G4-04– Battery Maintenance Management Program (BMMP).
- g. Environmental Protection Agency (EPA) Standards for Universal Waste Management, 40 CFR part 273.
- h. Occupational Safety and Health Administration (OSHA) Standards (29 CFR 1910.178(g)(1-12); 29-CFR 1910.305(j)(7)); 29 CFR 1910.132.
- i. Hawker (6T) Battery Material Safety Data Sheet (MSDS).

2. Purpose. This standard operating procedure (SOP) outlines the requirements for the proper recharging, storage and turn-in of Absorbed Glassmat (AGM) or Valve Regulated Lead Acid (VRLA) batteries used in military vehicles and equipment within XX Brigade/Battalion.

3. Scope. Provisions of this SOP are applicable to all subordinate units assigned to XX Brigade/Battalion.

4. Objectives.

- a. Reduce battery consumption and procurement cost by recovering/recharging AGM/VRLA type batteries.
- b. Reduce the incidences of premature battery disposal, extend battery performance and achieve cost savings to the Unit.
- c. Replacement through attrition of wet cell batteries with VRLA batteries.
- d. Establish a standard procedure for battery management in order to maintain all assigned equipment at a fully mission capable status.

5. Management Program.

- a. Personnel will use batteries prescribed by the equipment technical manual. Maintenance free, AGM/VRLA type batteries, will be used whenever possible to enhance readiness and reduce the logistics and environmental footprints.
- b. Testing and recovery of all AGM/VRLA batteries will be attempted and documented before discarding.
- c. Unrecoverable (used) AGM/VRLA batteries are considered "**UNIVERSAL WASTE**" as defined in 40 CFR part 273. Broken batteries may be "**HAZARDOUS WASTE**". The DPW Environmental Division Compliance Inspections Program must be contacted for guidance on the proper management of broken batteries.
- d. Supply Support Activities (SSA) will not accept AGM/VRLA batteries unless red tagged with a DD Form 1577 and unless each battery casing is permanently marked, as stipulated in 40 CFR 273.14, with the words "**Used Battery**" and with the **date** the battery was determined to be unrecoverable.
- e. All battery maintenance, testing, charging, servicing, and replacement will be performed per TB 9-6140-252-13 and OSHA Standards (29 CFR 1910.178(g)(1-12); 29-CFR 1910.305(j)(7)); 29 CFR 1910.132, and any other applicable safety guidelines.
- f. Missions permitting, battery inspections, conductance/diagnostic tests, servicing, and charging will be accomplished in the vehicle or platform while the batteries are still mounted on the equipment. It should be noted that most batteries are physically damaged during installation, removal, and transportation. For that reason, every attempt will be made to service the "dead" batteries in place before removing from the equipment.

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g. To ensure maximum battery life expectancy, discharge levels will not be allowed to fall below 50% or 12.2 Open Circuit Voltage (OCV) for 6TAGM/VRLA batteries. Charge will also be applied whenever the battery OCV is 12.7 or less. The batteries will be recharged to 100% capacity or 12.9 OCV. Recharging the batteries at less than 100% may result in premature battery failure.

h. Refer to Appendix 1 - Battery Management Program Flow Diagram for a detailed process sequence.

6. AGM/VRLA Battery Description.

a. There are a number of AGM/VRLA batteries available and used by the US Army, to include Hawker, Batcore, Exide, Optima, and Concorde. AGM/VRLA batteries are lead-acid batteries in which the electrolyte is held in thin fiberglass mats that are sandwiched between the battery plates. While flooded (wet) batteries have a large reservoir of electrolyte surrounding the battery plates, an AGM/VRLA battery has only a very small amount of electrolyte held in the mats directly between the plates. Due to the nature of this construction, the battery is sealed and classified as "Maintenance Free". Each cell has a vent cap to allow the battery to vent any gases that are generated internally. These vent caps should not be removed while servicing the battery.

b. AGM/VRLA type batteries do not require maintenance beyond recharging. **Under no circumstances should any attempt be made to introduce any substances, e.g. acid, distilled water, or alkali to the battery.** However, removing dust, dirt, or corrosion buildup on the exterior of the battery is recommended for optimal operation.

c. AGM/VRLA batteries are non-spillable. They will not leak or spill even if tipped over or accidentally cracked. These batteries will also work temporarily after cracked open or after taking a round.

d. AGM/VRLA batteries have a shelf life that is longer than traditional flooded lead-acid batteries. This type of battery can also be held in storage for an extended period of time and still have the power to perform many operational functions without having a charge applied before being placed into service. However, based on the manufacturer's recommendation, a battery that is 30 days or more from the date of manufacturing should be topped off (recharged) before being placed into service. This will significantly increase the life expectancy of the battery and improve overall performance.

e. AGM/VRLA batteries have proven to be highly recoverable. They can be fully recharged, multiple times, from a complete discharged (dead) state.

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f. Hawker, Batcore, and Exide 6TAGM/VRLA batteries are authorized as a direct replacement to the conventional 6TMF flooded ("wet") cell lead-acid automotive batteries used in tactical or combat vehicles.

g. Optima and 24 Volts Direct Current (VDC) Concorde AGM/VRLA type batteries are authorized for use in 5KW through 200KW generators.

h. Refer to Appendix 2 for examples of AGM/VRLA type batteries and National Stock Numbers (NSNs).

7. Testing, Charging, and Maintenance Equipment.

a. PulseTech 490 series battery analyzers or similar devices are recommended for testing the batteries.

b. AGM/VRLA batteries need a high quality charger. Charger should be an automatic type as to not accidentally overcharge the battery if it is left connected. Constant current chargers are not recommended for charging AGM/VRLA batteries. A pulse charger (smart charger) must be use instead.

c. A battery maintenance charge system should be use to keep batteries that are stored for an extended period of time from sulfating and in a fully charged state.

d. Refer to Appendix 3 for examples of battery testing, charging, and maintenance equipment with corresponding NSNs.

8. Responsibilities.

a. Commanders:

(1) Ensure all battery shops are operated in an Occupational Safety and Health Organization/Environmental Protection Agency compliant manner.

(2) Appoints on orders battery management and maintenance personnel to oversee the daily operation of the battery maintenance shop.

(3) Establish a Battery Management SOP to support daily operations.

(4) Ensure assigned personnel are competent on the basis of appropriate education, training, and/or experience to perform their assigned duties.

(5) Ensure necessary equipment supplies and publications are identified and available to assigned personnel. This include, but is not limited to, proper battery

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maintenance/charging equipment, appropriate personal protective equipment (PPE), spill equipment, technical manuals/bulletins, and policy memorandums.

(6) Overall responsible for compliance with instructions and procedures established for the battery maintenance shop.

(7) Incorporate the Battery Management Program into their Command Maintenance Discipline Program (CMDP).

(8) Submit a battery utilization report to the G4 NLT the 5th of each month.

b. Maintenance Management Personnel.

(1) Use batteries prescribed by the equipment technical manual. Maintenance free, AGM/VRLA type batteries, will be used whenever possible to enhance readiness and reduce the JRTC and Fort Polk logistics and environmental footprints. Replace flooded (wet) lead-acid batteries with AGM/VRLA type batteries thru attrition.

(2) Mission permitting, test batteries in the platform and make every attempts to charge without removing IAWTB 9-6140-252-13.

(3) Apply charge whenever the AGM/VRLA battery OCV is 12.7 or less. Recharge battery to 100% capacity or 12.9 OCV. Leaving batteries in a discharged condition, even a partial discharge, will cause solvation on the plates which then reduces battery capacity and leads to premature battery failure.

(4) If determined necessary, remove AGM/VRLA battery from platform and take to the supporting maintenance facility for a "one" for "one" exchange.

(5) Turn-in all other battery types (non AGM/VRLA) IAW unit supported battery management shops.

(6) SOP. Permanently mark each battery casing, as stipulated in 40 CFR 273.14, with the words "**Used Battery**" and with the **date** the battery was determined to be unusable.

c. Battery Maintenance Facility Operators.

(1) Appointed by the unit commander per Appendix 4 to manage the battery shop. Duties include, but are not limited to, receiving, testing, recharging, maintaining, tracking, and re-issuing replacement batteries to unit personnel, or turning-in "unserviceable/condemned" AGM/VRLA batteries to the unit supported SSA for consolidation.

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(2) Be competent on the basis of appropriate education, training, and/or experience to perform battery management duties as assigned.

(3) Perform all battery maintenance, testing, charging, servicing, and replacements IAW TB 9-6140-252-13, OSHA Regulations (29 CFR 1910.178(g) and 29-CFR 1910.305(j)(7)), and other applicable safety guidelines.

(4) Maintain and use all assigned PPE and spill equipment IAW applicable safety guidelines.

(5) Maintain the AGM/VRLA battery recovery log provided in Appendix 5.

(6) Keep AGM/VRLA batteries stored at the battery maintenance facility, connected to a battery maintainer to prevent sulfating and to ensure the batteries are fully charged before re-issuing.

(7) Test, determine condition, and tag batteries received with the appropriate condition code.

- Yellow tag (DD Form 15 4) for serviceable batteries. Battery is good for reuse or stock.

- Red tag (DD Form 1577) battery is damaged or not recoverable after three days of attempting to charge.

(8) Permanently mark each AGM/VRLA battery casing with the words "**Used Battery**" and with the **date** the battery was determined to be unrecoverable.

(9) Duct tape exposed battery terminals to prevent external short circuiting and stack used batteries on pallets IAW para 14 below.

(10) Prepare a DA Form 2404 for batteries that are red tagged and classified as unrecoverable. Multiple batteries can be listed on the DA 2404 form, provided that each battery is identified by its unique serial number on the form.

(11) Turn-in unserviceable/condemned batteries to the unit's supporting SSA along with the DA 2404. Unserviceable/condemned batteries must have the DD1577 attached.

(12) Maintain an MSDS for each type of battery stored and managed at the battery shop.

(13) Maintain current copies of all applicable reference publications, technical bulletins, manuals, and policy memorandums on-site.

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d. Supply Support Activities (SSA):

(1) Consolidate unserviceable/condemned AGM/VRLA batteries turned-in by the supporting units.

(2) Maintain a Universal Waste Collection Log for all battery types (flooded lead-acid, AGM/VRLA, lithium, etc.)

(3) Ensure all batteries received/accepted are properly marked, tagged and documented.

- Each used battery, of all types (flooded lead-acid, AGM/VRLA, lithium, etc.), must be permanently marked with the words “**Used Battery**” and with the **date** the battery was determined to be unusable.
- Exposed battery terminals must be duct taped to prevent external short circuiting and stacked on pallets IAW para 14 below.
- 6TAGM/VRLA batteries can only be turned-in by appointed battery maintenance shop personnel after all attempts to recharge them have failed
- Each AGM/VRLA battery turned-in by the battery maintenance shop personnel must be red tagged using a DD Form 1577.
- A DA Form 2404 must also be completed by the battery maintenance shop personnel and submitted along with the AGM/VRLA batteries turned-in. Multiple batteries can be listed on the 2404 form provided that each battery is identified by its unique serial number on the form.

(4) Secure all used batteries to the pallet with stretch wrap IAW para 15 below.

(5) Turn-in unserviceable batteries to an approved battery reclamation and disposal facility.

9. Training. Unit personnel and Battery Maintenance Facility Operators must be adequately trained to perform their battery management duties. TACOM training video can be viewed via AKO at: <http://www.army.mil/article/28860/tacom-battery-training-videos>.

10. Battery Charging Facility Requirements.

- a. An MSDS for each type of battery being serviced will be maintained at the facility.
- b. Battery charging room must be well-ventilated with impervious surfaces and

adequate containment in the event of spills.

c. Signs prohibiting smoking or the use of open flames, sparks, or other devices used as igniting sources will be displayed at the facility.

d. Emergency shower must be available, inspected, and maintained in good operating condition.

e. Non-combustible dry sweep, absorbent materials, and spill control equipment will be kept on hand in the event of a spill. Even if AGM/VRLA are non-spillable lead-acid batteries, and are not expected to leak or spill, caution must still be exercised when handling this type of battery.

11. Safety Precautions.

a. 6TAGM/VRLA type batteries weigh 88 pounds. Follow safe lifting and carrying procedures to prevent back injuries. Batteries should be carried by the casing handles. a two-man lift is recommended.

b. Remove all jewelry, such as rings, ID tags, watches, and bracelets when charging batteries. If jewelry contacts a battery terminal, a short can result and may cause injury to personnel and/or damage equipment.

c. AGM/VRLA batteries are non-spillable batteries and are not expected to leak or spill even if tipped over or accidentally cracked. However, they still contain sulfuric acid electrolyte into fiberglass matting, so proper care and considerations should be taken to protect equipment and personal clothing when handling batteries with damaged or broken cases.

d. Make certain vent caps are on securely and avoid contact with internal battery components. Wear approved acid resistant protective clothing and wash and neutralize battery box after removing damaged battery pieces. Use soda ash or lime to neutralize if necessary.

e. AGM/VRLA type batteries do not require maintenance beyond recharging. **Under no circumstances should any attempt be made to introduce any substances, e.g. acid, distilled water, or alkali to the battery.** However, removing dust, dirt, or corrosion buildup on the exterior of the battery is recommended for optimal operation.

f. Perform all charging functions in a well ventilated area. The potential for hydrogen gas build up and explosion exists with any lead-acid battery including AGM/VRLA type batteries.

g. In the case of AGM/VRLA type batteries, small quantities of hydrogen gases are

released from the battery pressure relief valve during normal charging. Typically, the hydrogen gas dissipates very rapidly and never reaches a concentration level that is hazardous. However, if the battery is being charged in an enclosure with minimal airflow, the concentration of hydrogen could build up to a high enough concentration to be of concern. A torch, match, flame, lighted cigarette, or any spark from metal tools accidentally contacting the battery terminals could cause ignition of these gases.

h. Immediately stop charging any battery that develops signs of melting or swelling or if the surface temperature of the case is too hot to comfortably touch with a bare hand. Do not handle or attempt to move battery until it has cooled for a couple hours to avoid the risk of an explosion.

i. Refer to the battery MSDS for additional safety precautions and handling instructions.

j. Report any safety incidents to the officer in charge and in accordance with your Unit's specific safety procedure.

12. AGM/VRLA Battery Charging Procedure.

a. General.

(1) This charging procedure applies to AGM/VRLA type batteries **ONLY**. AGM/VRLA batteries do not require recharging by adding liquid like flooded lead-acid (wet) batteries.

(2) Verify that adequate ventilation is available and that exhaust fan and charging equipment are in good operating condition before attempting to service/charge any battery.

(3) Perform testing, recovering, and charging AGM/VRLA type batteries IAW TB 9-6140-252-13 and charging equipment operator's manual.

b. Battery Recovery Log.

(1) Log batteries IAW recovery log provided in Appendix 5 upon receiving a battery from the using organization.

(2) Manage and store batteries in such a way that the oldest battery will be placed back into operation first.

c. Pre-Charge Battery Inspection.

(1) Perform a visual inspection before starting to test or recover any battery.

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Batteries with physical damage described below should be turned-in for reclamation/recycling.

(2) Permanently mark each damaged AGM/VRLA battery casing with the words **“Used Battery”** and with the **date** the battery was determined to be unusable.

(3) Attach a red unserviceable (condemned) tag, DD Form 1577, to the battery before turning-in to the supporting Unit SSA.

(4) Prepare a DA Form 2404 and turn-in along with the battery to the supporting unit SSA.

(5) Refer to Appendix 6 for a completed DA Form 2404 example.

(6) Visual inspection should include:

- Check top, sides, and bottom for cracks, dents, leaking or swelling in the battery case and lid.
- Check that battery lid and case is sealed.
- Make sure terminals are not melted, bent, or otherwise damaged.
- Check that the battery is not missing cell vent caps. **Do not attempt to replace missing vents.**
- Check that all vent caps are in place (flush) and do not appear to be elevated. Elevated vent caps are a sign of a defective vent or that the battery has gassed excessively. Gently tap vent back in place, then with a permanent marker, mark the vent with an “R”. If it elevates again during charging or operational use, dispose of battery.
- If a battery is turned in for recharge and a vent cap with an “R” marked on it is elevated again, disposal is authorized without further testing. Label battery as “Damaged” and attach a red DD Form 1577 tag and DA Form 2404.

d. Pre-Charge Battery Testing.

(1) After performing the visual inspection, test the battery for potential internal electrical damage.

(2) Using a battery post cleaner or wire brush, clean any corrosion build-up from the terminals.

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(3) Perform conductance testing with a diagnostic tester equipped with a digital read-out. The digital display will provide the state of health of the battery; cold cranking amps (CCA) and OCV; the display will also indicate whether the battery needs to be recharged and re-tested or if the battery has a bad cell. If no internal damage is indicated on the digital display, proceed with charging procedure.

(4) Sort batteries according to state of charge (SOC). To increase recovery rate and turnaround time, efforts should focus on recharging the highly recoverable batteries, requiring the least amount of charge time, first.

(5) PulseTech 490 series battery analyzers or similar devices are recommended for testing the batteries. **Refer to Appendix 3 for examples and National Stock Numbers (NSNs).**

e. Battery Charging.

(1) AGM/VRLA batteries need a high quality charger. Charger should be an automatic type as to not accidentally overcharge the battery if it is left connected. Constant current chargers are not recommended for charging AGM/VRLA batteries. Use a pulse charger (smart charger) instead. **Refer to Appendix 3 for examples and National Stock Numbers (NSNs).**

(2) Charge the battery according to the diagnosis displayed on the analyzer and by following the charger manufacturer's recommendation for charging rates, settings and connections. Connect batteries to the charger, ensuring clamp wiring and contacts are tight, clean and free of corrosion to assure good connections.

(3) 6TAGM/VRLA batteries are fully charged at 12.9 OCV. Charging is required when the OCV is 12.7 or less. For optimum battery performance and life expectancy, discharge levels should not be allowed to fall below 50% or 12.2 COV. The batteries will be recharged to 100% capacity or 12.9 OCV. Recharging the batteries at less than 100% may result in premature battery failure.

(4) To increase recovery rate and turnaround time, efforts should focus on recharging the highly recoverable batteries first. Batteries with higher (SOC) will require the least amount of charge time.

(5) Examine batteries daily during the charging cycle.

(6) Charge batteries for 48 hours. Weekend charging can be performed, but daily checks are required to assure proper operation (no excessive gassing, leaking, proper voltage applied) and to determine whether charge has completed.

OFFICE SYMBOL
SUBJECT: Battery Management SOP

(7) Severely depleted batteries can take up to three days or even longer to recharge.

(8) Batteries are recovered when charge current (amp meter on charger) drops to less than 1 amp per battery and holds there for 3 hours. Automatic chargers will stop charging and give a screen reading of "Charge Complete" and/or completion light.

f. Battery Resting Period.

(1) After completing the charge, remove batteries from charger and allow them to settle (rest/cool), preferably overnight, before retesting and reissuing. Refer to TB 9-6140-252-13 for additional information on rest time and tests that must be performed.

(2) Batteries that are still heated from charging process may give erroneous readings.

g. Post Charge.

(1) After the resting period, test the battery charge and health according to TB 9-6140-252-13.

(2) The charging cycle may need to be repeated to ensure full recharge of the battery. Refer to TB 9-6140-252-13 for additional instructions.

(3) Determine if the battery is fit for reissue, stocking, or classified as unserviceable thereby requiring turn-in to the supporting Unit SSA.

(4) Tag the battery according to its condition code.

- Yellow tag (DD Form 1574) for serviceable batteries. Battery is good for reuse or stock.
- Red tag (DD Form 1577) battery is damaged or not recoverable after three (3) days of attempting to charge. Permanently mark each AGM/VRLA battery casing with the words "**Used Battery**" and with the **date** the battery was determined to be unrecoverable.

(5) Prepare a DA Form 2404 (Appendix 6) for batteries that are red tagged and classified as unrecoverable.

(6) Keep AGM/VRLA batteries stored at the battery maintenance facility, connected to the battery maintainer (Appendix 3) to prevent sulfating and to ensure the batteries are fully charged before re-issuing.

(7) Depending on the length of time held in storage, a top-off charge may need to

be applied before placing the battery into service. Per the manufacturers' direction, 6TAGM/VRLA type batteries should be recharged before placing into service if the OCV is <12.7 VDC.

h. Placing Batteries Back Into Service.

- (1) Top off (charge) battery before issuing as necessary.
- (2) On the battery recovery log, indicate the using organization and date the battery was re-issued.

13. Turn-in Procedure.

a. Battery maintenance shop personnel will properly mark, tag, and document unrecoverable AGM/VRLA batteries as follows:

- Permanently mark each AGM/VRLA battery casing with the words "**Used Battery**" and with the **date** the battery was determined to be unrecoverable.
- Attach a red unserviceable (condemned) tag, DD Form 1577, to the battery before turning-in to the supporting Unit SSA.
- Duct tape exposed battery terminals to prevent external short circuiting.
- Prepare and attach a DA Form 2404 for AGM/VRLA batteries classified as unrecoverable before turning them in to the supporting unit SSA. Note that multiples batteries can be listed on the 2404 form provided that each battery is identified by its unique serial number on the form.

b. Battery maintenance shop personnel will turn-in marked, red-tagged, unrecoverable batteries to the supporting Unit SSA for consolidation.

c. SSA's will not accept AGM/VRLA batteries unless properly marked, tagged, and documented by appointed SBCT battery maintenance shop personnel.

14. Stacking Used Batteries on Pallets.

a. Battery maintenance shop personnel will prepare and stack used AGM/VRLA batteries on pallets IAW the below instructions.

b. Select a sturdy pallet with no broken or missing boards. Be sure there are no nails sticking up, which could puncture the batteries.

c. Place a layer of cardboard on the pallet to prevent the batteries from sliding off the pallet.

d. Make the first layer of batteries level and as close together as possible. If some of the batteries are shorter, they should be placed in the center layers. Any taller batteries should be placed on the top layer.

e. Duct tape exposed battery terminals to prevent external short circuiting IAW TB 43-0134.

f. Place waffle board (preferred) or sufficient cardboard (multiple sheets if necessary) between all layers, including the top layer of batteries to prevent possibility of puncturing the batteries above and short circuit. Place cardboard on top of pallet.

g. Do not stack more than three layers of batteries per pallet.

h. Damaged batteries that are not visibly leaking electrolyte must be put in heavyweight polyethylene plastic bags (minimum 6 mil), properly sealed with a plastic tie and placed in the middle of the top layer.

15. Wrapping Used Batteries on Pallets.

a. SSA's will secure all used batteries to the pallet with stretch wrap.

b. Stretch wrap works best if it is pulled tight before stretching it around the corners.

c. Start with the stretch wrap turned sideways to create a rope effect. Wrap around the top layer twice.

d. Still using the rope effect, wrap the top layer twice "again, crossing over the top each time to form an "X-pattern". This will pull the batteries towards the center to prevent batteries from falling off of the pallet, a DOT requirement.

e. Hold the stretch wrap open, wrap around the bottom layer twice, being sure to catch the edges of the pallet.

f. Finally, after placing cardboard on top of the batteries, wrap around the top layer twice with the stretch wrap in the open effect and tear at the last corner.

Signature Block
Commander

