FILE FOLDER

DESCRIPTION ON TAB:

Lithium Batteries

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6241 HYGIENE AND SANITATION

(PERMANENT) SECNAVINST 5212.5B
PART II, CHAP. 6, PAR 6240(1) 2 YRS

Bldg #'s

BAI

25.

107

307

651

GEORGE Eggrs

TP 451

382

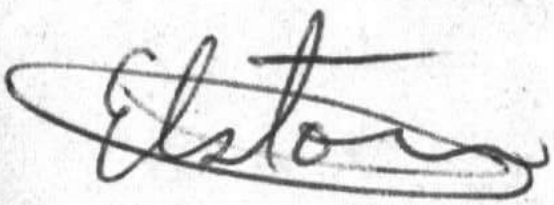
TO:

DDS

for info

Dww

TO: Ken



FOR AC/S FAC File 6240

UNCLASSIFIED

G-4 Div CLNC
13 Aug 82

NREA — for info

POINT PAPER

Subj: Lithium Batteries (LB)

1. New radio and crytographic equipment, (AN/PRC-104 and KY-57/58) is powered by LB.

2. Many existing batteries will be replaced by LB. Future high use is expected in the AN/PRC-77.

3. LB characteristics:

a. High operating voltage.

b. Low weight to energy ratio (more power per pound than alkaline batteries).

c. Long shelf life.

d. Good efficiency at low temperature.

e. Cannot be recharged.

f. Higher cost than alkaline batteries.

FAC ROUTING 18 AUG 1982

	ACTION	INFO	INT
FACO			
4A			
4B			
4C			
4D			
4G			
4LC			

4. LB design:

a. Contains lithium metal, sulfur dioxide and organic solvents under pressure.

b. Protected by slow blow replaceable fuse.

c. Protected by pressure relief valve designed to vent each cell of multi-celled batteries at 350-450 psi.

5. Department of Transportation (DOT) classifies LB as hazardous waste.

6. Lithium metal is flammable when exposed to air; sulfur dioxide is noxious; organic solvents are corrosive.

7. The U.S. Army and Navy have more experience than the U.S. Marine Corps does in use of LB. Several incidents have occurred in earlier "unbalanced" LB. During 1979-1980 manufacturers have redesigned the cells to "balance" the amounts of lithium and sulfur dioxide and the incidents have not recurred.

8. Recently there have been changes to U.S. Navy policies for embarked Marine use, reuse, and storage of LB aboard amphibious ships:

a. Storage of new batteries is allowed below decks.

b. Storage of used and depleted batteries is allowed in jettisonable lockers located on weather decks.

c. Shipboard equipment checks may now be conducted in topside locations.

9. No definitive guidance from NAVELEX, NAVFAC, CMC, MCDEC, or FMFLant exists on proper and safe storage, use, and disposal of LB.

10. Conflicting parameters exist:

a NAVELEX requires sprinkler systems in storage areas. FMFLant Science Advisor states that under certain conditions water will cause a reaction with an exposed cell (damaged battery) to release hydrogen gas. Methane gas could also be released. If an explosion occurred, energy equivalent to 0.1 lb of TNT could be expected from the BA-5590/U (PRC-104 battery). CO, 2d FSSG advised all units to store all LB in a manner to avoid damage to the containers and a location to avoid contact by WATER. This appears to preclude outside storage and sprinkler protected warehouses.

b. NAVFAC and CMC recommend the use of class D fire extinguishers. Class D units are intended for metal fires (phosphorous, lithium, magnesium, etc.). A 16 LB class D extinguisher is available through the base purchasing office for $54.48 each when purchased in quantities of 30-50.

c. Base Fire Department does not currently have the capability to recharge these units.

d. The Fire Department has not identified a specific need for this type of extinguisher. The Chief Inspector indicates that the current class "ABC" dry chemical (powder) may suffice for our needs.

e. Mr. ODERWAL (CMC code LMA-LB Project Officer) indicated that during a recent test a balanced BA-5590 was shot by a rifle. It did not burn or explode. There was an odor similar to rotten eggs (sulfur dioxide).

f. Mr. ODERWAL (CMC-LMA) and Mr. PRESCOTT (FMFLant Science Advisor) both share the opinion that eventhough incidents/accidents have occured in the past, that the redesigned balanced cell LB provides no further hazard than Marines are accustomed to in dealing with current automotive and comm-elec wet cell batteries.

11. SUMMARY:

a. Information available from 1979 to present is somewhat conflicting. 1979 instructions were written based on experience gained from the use of unbalanced cells. Current information is revised based on the balanced cell technology. Proper indoctrination and supervision of lithium battery users should preclude personal injury and/or damage to equipment.

b. CG, FMFLant has requested information from CDR CORADCOM Ft. Monmouth, N.J. for specific information on storage and use. Reply is anticipated by 30 Aug 82.

Ken Note and
file under
Lithium Batteries

I Think a folder
is already set up

Nread

To Danny Fitz 10-25-83 DDS

DOB467

RTTUZYUW RUEBDOB6473 1111612-UUUU--RHCJSUU.
ZNR UUUUU
R 2121532 APR 83
FM CG SECOND FSSG
TO ALL SECOND FSSG
R 191627Z APR 83
FM CG FMFLANT
INFO FMFLANT
XMT CAMP ELMORE NORFOLK VA
R 2814Ø2Z MAR 83
FM CMC WASHINGTON DC
TO CG FMFLANT
CG FMFPAC
CG LETCLANT NORFOLK VA
CG FOURTH FSSG
MCCES TWENTYNINE PALMS CA
MARBKS GUANTANAMO BAY CUBA
AIG EIGHT
XMT CG MCRD PARRIS ISLAND SC
CG MCRD SAN DIEGO CA
HQBN HQMC ARLINGTON VA
MARBKS WASHINGTON DC
FIRST MARCORDIST GARDEN CITY LI NY
MARFINCEN KANSAS CITY MO
BT
UNCLAS//NØ44ØØ//
SUBJ: LITHIUM BATTERY STORAGE GUIDELINES (CMC CODE LMA-3/LMM-2/LFF-2)
A. HQ DPDS BATTLE CREEK MI 1Ø1349Z FEB 83 (NOTAL)
1. GENERAL:
A. LITHIUM BATTERIES, EIGHER FRESH OR USED/DEPLETED, ARE NOT TO BE PIERCED, CRUSHED, BURNED, INTENTIONALLY DROPPED, CANNIBALIZED, DISMANTLED, MODIFIED, OR OTHERWISE CARELESSLY HANDLED, NOR SHALL THEY BE SHORT CIRCUITED, CHARGED OR USED IN ANY WAY OTHER THAN THEIR INTENDED USE.
B. ALTHOUGH LITHIUM BATTERIES ARE CLASSIFIED AS FLAMMABLE SOLIDS BY THE DEPT. OF TRANSPORTATION, THE POTENTIAL FOR A FIRE TO START IN THE PACKAGED ITEM IS CONSIDERED THE SAME AS FOR ORDINARY COMBUSTIBLE MATERIALS. HOWEVER, IF INVOLVED IN A FIRE, THE CLASSIFICATION FOR EXTINGUISHMENT PURPOSES WOULD BE "EXTRA HAZARD".

Apr 21 11 42 AM '83

28 14 Encl 1 02

2. STORAGE AREA/FACILITY:

A. REFRIGERATED STORAGE IS NOT REQUIRED.

B. THE STORAGE AREA SHOULD HAVE ADEQUATE VENTILATION TO PREVENT BUILD-UP OF FUMES FROM ANY VENTING/LEAKING BATTERIES AND ALLOW AVOIDANCE OF TEMPERATURES EXCEEDING 130 DEGREES FAHRENHEIT.

C. THE STROAGE AREA SHALL BE IN A FLAMMABLE/HAZARDOUS STOREHOUSE WITH SPRINKLER PROTECTION, IF AVAILABLE. A FLAMMABLE/HAZARDOUS STOREHOUSE WITHOUT SPRINKLERS WILL BE THE SECOND CHOICE. OUTSIDE STORAGE IN A GENERAL STORAGE SHED OR IN VENTILATED LOCKERS IN A LIMITED ACCESS AREA ARE ALSO OPTIONS IF STACKED/STORED BAITERIES WOULD NOT BE SUBJECTED TO TEMPERATURES EXCEEDING 130 DEGREES FAHRENHEIT. ADDITIONALLY, A GENERAL PURPOSE WAREHOUSE MAY BE USED TEMPORARILY IF NONE OF THE PRECEEDING TYPES OF STORAGE FACILITIES ARE AVAIL AT THE TIME STORAGE IS REQUIRED. HOWEVER, OTHER COMBUSTIBLE MATERIAL AND OTHER MORE HAZARDOUS COMMODITIES SHALL NOT BE STORED IN THE SAME FIRE AREA AS THE BATTERIES WHEN THE AREA IS NOT SPRINKLER PROTECTED.

D. SMOKING SHALL BE STRICTLY PROGIBITED AND "NO SMOKING" SIGNS POSTED CONSPICUOUSLY IN BATTERY STORAGE AREAS. THE USE OF OPEN FLAME DEVICES SHALL BE RESTRICTED TO OPERATIONS UNDER PROPER SUPERVISION AND WITH ADEQUATE FIRE-PREVENTIVE SAFEGUARDS.

E. ALL LITHIUM BATTERY STORAGE AREAS SHALL BE EQUIPPED WITH A CLASS D" EXTINGUISHER, PREFERRABLY LITH-X-TYPE. IN THE EVENT THAT A CLASS D" IS NOT AVAILABLE FOR ANY REASON, A WATER EXTINGUISHER MAY BE USED; IN SUCH CASES, EFFORT SHOULD BE AIMED AT PREVENTING THE SPREAD OF FIRE TO OTHER COMBUSTIBLES AND NOT DIRECTED ON THE BURNING LITHIUM CELLS.

F. AIR RESPIRATORS OR SELF-CONTAINED BREATHING APPARATUS APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH) SHALL BE WORN WHEN ENTERING STORAGE SPACES WHERE LITHIUM BATTERIES ARE VENTING OR HAVE VENTED.

3. STORAGE/PACKAGING PROCEDURES.

A. IN ANY FACILITY, STACKS OF LITHIUM BATTERIES SHALL BE LIMITED TO 2000 SQ. FT. IN AREA WITH THE WIDTH OF THE STORAGE UNIT NOT MORE THAN 25 FT. AISLES BETWEEN STACKS SHALL BE 6 FT OR ONE-HALF THE STACK HEIGHT, WHICHEVER IS GREATER. A MINIMUM OF 2 FT CLEARANCE SHALL BE MAINTAINED BETWEEN STACKS AND ANY WALL. A 3 FT CLEARANCE SHALL BE MAINTAINED BETWEEN A STACK AND ANY FIRE DOOR OPENING. A VERTICAL CLEARANCE OF 3 FT SHALL BE MAINTAINED BETWEEN THE TOP OF STACKS AND SPRINKLER HEADS OR CEILING/ROOF CONSTRUCTION IN UNSPRINKLERED FACILITIES.

B. NO OTHER MATERIAL OR COMMODITY WILL BE STORED IN THE SAME STACK WITH THE BATTERIES.

C. NEW LITHIUM BATTERIES SHOULD BE STORED IN THEIR ORIGINAL SHIPPING CONTAINERS. IN-SO-FAR AS IS POSSIBLE, UNITS USING LITHIUM BATTERIES SHOULD SAVE THE SHIPPING CONTAINERS FOR REPACKAGING USED/DEPLETED LITHIUM BATTERIES TO FACILITATE TRANSPORT AND/OR TEMP STORAGE PRECEEDING REUSE/DISPOSAL.

D. IF ORIGINAL SHIPPING CONTAINERS ARE NOT AVAILABLE, USED AND DEPLETED LITHIUM BATTERIES MAY BE REPACKAGED AND STORED (PENDING FURTHER USE OR DISPOSAL, RESPECTIVELY) IN SIMILAR WOODEN OR STRONG FIBERBOARD BOXES WHICH MEET DOT 128 SPECIFICATIONS. IF METAL CONTAINERS ARE USED, THEY MUST HAVE AN OVER-PRESSURE/VENT CAPABILITY. NOTE: REF A AUTH TURN-IN OF LITHIUM BATTERIES (FOR DISPOSAL) IN PLASTIC BAGS. HOWEVER, BECAUSE SURFACE TRANSPORT IS INVOLVED IN THE TURN-IN PROCESS, PACKAGING THE DEPLETED BATTERIES SECURELY WITHIN STRONG CONTAINERS IS CONSIDREED TO BE A PRUDENT APPROACH.

E. CONTAINERS OF USED OR DEPLETED BATTERIES ARE TO BE APPROPRIATELY AND CONSPICUOUSLY MARKED/LABELED AS PRESCRIBED IN SUBPART "D" AND "E" OF 49CFR. FOR EXAMPLE, DOT "FLAMMABLE SOLIDT MARKING AND THE WORDS CONTAINS LITHIUM METAL".

F. CONTAINERS OF USED OR DEPLETED LITHIUM BATTERIES ARE NOT TO BE PLACED IN THE SAME STACKS AS NEW BATTERIES OR OTHER COMBUSTIBLE MATERIAL.

G. DEPLETED LITHIUM BATTERIES ARE NOT ALLOWED TO ACCUMULATE AT USING UNITS; DESPOSAL SHOULD BE EFFECTED AS PROMPTLY AS POSSIBLE, I.E. A TARGET LIMIT FOR TEMP STORAGE SHOULD BE A MAXIMUM OF 30 POUNDS OR 30 DAYS. A COLLECTION POINT/STORAGE AREA SEPARATE FROM NEW/USED BATTERIES AND OTHER COMBUSTIBLE MATERIAL SHALL BE ESTABLISHED FOR BATTERIES AWAITING DISPOSAL. LITHIUM BATTERIES ARE NOT TO BE DISPOSED OF NOR TRANSPORTED WITH NORMALLY GENERATED REFUSE.

4. HQMC POC IS LICOL W.N. LOWE, LMA-3, (A) 224-2039.

BT

#8473

HAS BEEN SENT

WATCH / CCN / CWO	C/S	G-1	G-2	PLANS	INSP	CAPLAN	G-3	COMPT	CSS	SJA	DISBO	AAV	FDSVCOFF	CBO	PEDSO	JPAO	I&MO	CMAP	FOSTO	NAVY REDS	L.O.U.	COMMEN	ENGRBN	MTBN	ANGLICO	RECONCO	HLSBN	MAINTBN	SUPBN	DENBN	MEDBN	CFAO	LOGSPTBN	MSG-2/2	MSG-	MSG-	MSG-	BSG-1	RADBN	FSMO-1	EASC		
ORIG									X																																		
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NREAD/DDS/dr
6240

JUN 20 1983

/ Supervisory Ecologist

Director, NREAD

Lithium Battery Storage/Disposal

REF: (a) Mtg at AC/S Log Office of 17 June 1983
(b) CG 2dFSSG 292150Z Apr 83

1. During reference (a), Assistant Chief of Staff, Logistics led the discussion relative to the subject issues. Representatives from DPDO, Base, MCAS, 2d FSSG, Division and MAG's were present. The following issues arose:

a. Inadequate storage facilities for lithium batteries, basewide.

b. No fire extinguishers suitable for lithium fires on base.

c. PP&P having problems getting form 1348-1 filled out properly by generating units.

d. Problem shipping a selected quantity of lithium batteries to Ft. Mammouth, New Jersey for testing. (COL Formanek agreed for base to transport in military vehicle as required by regulations.)

2. 2d FSSG has sent a message, reference (b), to base requesting lithium battery storage. I advised COL Fitzgerald that COL Formanek may be calling Facilities about progress made on the request. Chief Padgett, Base Fire Department, has apparently (was stated during reference (a)) requested the location of all buildings where lithium batteries are stored in an attempt to address fire extinguisher problems.

3. Mr. George Eggers stated that DPDO could take physical custody of used (undamaged or damaged) balanced lithium batteries but could not take custody of unbalanced batteries. COL Formanek indicated he was planning to get message to CMC requesting action to get DPDO to take unbalanced lithium batteries.

4. Except for response to reference (b) and Chief Padgett's involvement with fire extinguishers, no immediate action appears to be required of Facilities organizations.

DANNY D. SHARPE

SOP FOR BATTERY INCIDENT
2d FSSG

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EX ONLY format sample

INE

R 161750Z AUG 84

FM CG SECOND MARDIV

HAS BEEN SENT

TO CMC WASHINGTON DC

INFO CG FMFLANT
CG SECOND ~~FSSG~~ MARDIV

CG SECOND MAW
SECOND MARDIV

UNCLAS //N05100//

FOR: LMA-3; INFO: CEO/SAFETY O/FMFLANT SCI ADV
SUBJ: LITHIUM BATTERY INCIDENT REPORT BA-5590, 6135-01-036-3495

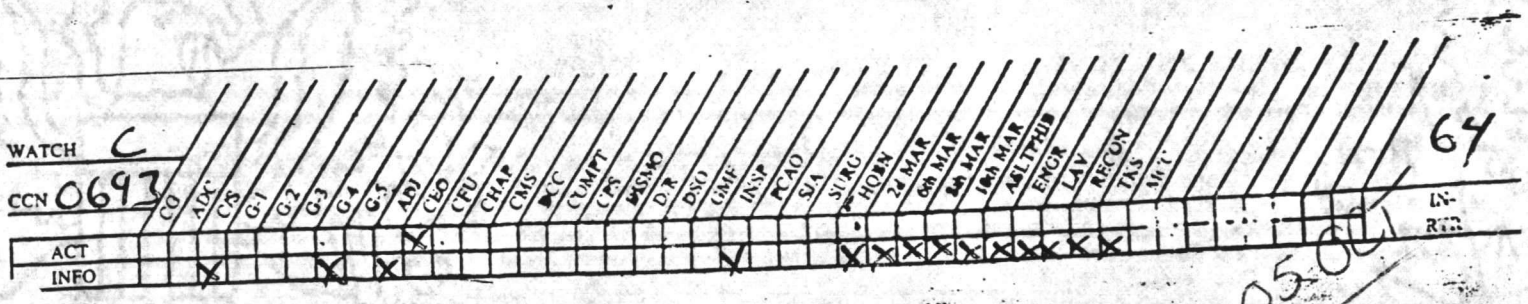
A. CMC WASHINGTON DC 091403Z JUN83

1. IAW REF FOL RPT SUB:
   A. TYPE OF BATTERY: BA-5590
   B. MANUFACTURER: POWER CONVERSION INC
   C. CONTRACT NO.: DAAB07-83-H353
   D. LOT NO.: 0384
   E. SERIAL NOS: 21829, 21834, 21682, 22067, 21819, 21643, 21665, 21940, 21873, 21989, 21838, 21519, 21939, 21631, 21900, 21905, 22054, 21642, 21867, 21554, 21530.
   F. CIRCUMSTANCES: VISUAL INSPECTION OF 300 NEWLY RECEIVED BA-5590'S REVEALED 21 HAD BROWN/AMBER LIQUID INSIDE SEALED PLASTIC BAG. NO UNUSUAL ODOR DETECTED; NO EVIDENCE OF BATTERY CASE DETERIORATION AT THIS TIME. BATTERIES WERE NOT SUBJ TO ROUGH HANDLING WHILE IN HANDS OF USING UNIT. BATTERIES WERE RECEIVED IN UNIT ONLY FEW DAYS BEFORE BEING OPENED.
   G. PRESENT LOCATION/DISPOSITION OF BATTERIES: HQ 8TH MAR IN ISOLATED STORAGE; WILL HOLD 90DAYS PENDING SPECIAL DISPOSITION INSTRUCTIONS, IF NONE THEN WILL SEND TO DISPOSAL.
   H. POC MAJ R. I. HALL, ACEO-MAINT AVN 484-1375/1378.

2. QDR M12000-84-002R PROCESSING FOR SUBMISSION.

3. SEVERAL HUNDRED OTHERS OF THIS CONTRACT/LOT NO HAVE BEEN INSPECTED WITH NONE EXHIBITING ANY DEFECTS AT THIS TIME.

BT



17-16-05-001

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DDS
3M

UNITED STATES MARINE CORPS
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA 28542

IN REPLY REFER TO
6280/2
FAC
16 NOV 1984

From: Commanding General, Marine Corps Base, Camp Lejeune, North Carolina

Subj: DISPOSAL OF LITHIUM-SULFUR DIOXIDE BATTERIES

Ref: (a) LANTDIV ltr 6280 1143SGO dtd 26 Oct 1984

Encl: (1) "The Handling, Storage, and Disposal of Lithium-Sulfur Dioxide Batteries," Hazardous Material Technical Center, Rockville, MD, June 1984

1. Per the reference, the enclosure is provided. POC is Mr. Bob Alexander, Environmental Engineer, extension 3034.

J. G. FITZGERALD
By direction

DISTRIBUTION: (Attn: Hazardous Material Disposal Coordinators)
2d MarDiv
6th MAB
2d FSSG (2)
CO, MCAS(H), NR
AC/S, Log
NREAD

II R7

DEPARTMENT OF THE NAVY
ATLANTIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK, VIRGINIA 23511-6287

TELEPHONE NO.
(804) 444-9565
IN REPLY REFER TO:

6280
1143SGO

20 OCT 1984

From: Commander, Atlantic Division, Naval Facilities Engineering Command

Subj: DISPOSAL OF LITHIUM-SULFUR DIOXIDE BATTERIES

Encl: (1) HMTC Report: The Handling, Storage and Disposal of Lithium Sulfur Dioxide Batteries

1. Enclosure (1) was developed by the Hazardous Materials Technical Center (HMTC) as a result of recurring questions concerning the proper handling, storage and disposal of lithium-sulfur dioxide batteries.

2. Enclosure (1) has been reviewed by NAVSEASYSCOM for accuracy and is hereby forwarded to serve as a ready reference source for activities utilizing lithium-sulfur dioxide batteries.

3. Point of contact at this Command is Mr. Steve Olson, telephone (804) 444-9565; autovon 564-9565.

David Goodburn
for J. R. BAILEY
By direction

Distribution:
NAS Oceana
NAVPHIBASE Little Creek
NAS Norfolk
PWC Norfolk
NAVSTA Norfolk
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FLEASWTRACENLANT
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NSC Cheatham Annex
NAVAIREWORKFAC Cherry Point
NAVAIREWORKFAC Norfolk
NAVSECGRUACT Sabana Seca
NAVWPNSTA Yorktown
NAVORDSTA Louisville

(Continued on next page)

ENCLOSURE (1)

NORFOLKNAVSHIPYD Portsmouth
NAVHOSP Portsmouth
NAVSECGRUACT Northwest
NAVCAMSLANT
MCAS H New River
MCAS Cherry Point
MCB Camp Lejeune
FMFLANT
LANTFLT HEDSUPPACT
COMDT AFSC
COMTACWINGSLANT
COMOPTEVFOR
NAVSTA Roosevelt Roads
NAVENVIRHLTHCEN Norfolk
NAVENPVNTHEDU TWO Norfolk
COMNAVBASE Norfolk
COMCBLANT
NAS Bermuda
NAF Lajes
NAS Guantanamo
NAVSTA Keflavik
NAVFAC Argentia
NAVFAC Bermuda
NAVFAC Brawdy
NAVFAC Keflavik
NAVSTA Guantanamo
NAVAVNWPNSFAC St Mawgan
NAVAVNWPNSFAC DET Machrihanish
NAVACTDET Holy Loch
NAF Mildenhall
NAS Sigonella
NAVSUPPACT Naples
NAVSUPPACT Naples Det Gaeta
NAVSUPPO La Maddalena
NAVSTA Rota
NAVSUPPACT Souda Bay
NAVMEDRSCHU THREE Cairo
NAVENPVNTMEDU SEVEN Naples
NAVSECGRUACT Augsburg
NAVSECGRUACT Edzell
NAVSECGRUACT Keflavik
NAVSECGRUACT San Vito Det Normanni
NAVSECGRUACT Terceira Island
NAVCOMMSTA Keflavik
NAVCOMMSTA Nea Makri
NAVCOMMSTA Thurso

(Continued on next page)

NAVCOMMDET Souda Bay
ADMINSUPU Bahrain
INACTSHIPFAC Portsmouth
NAVSTA Panama Canal
LANTFLTWPNTRAFAC Roosevelt Roads
NAVSECGRUACT Galeta
NAVCOMMSTA Balboa
NAVMMACLANT
NARU Norfolk
NAVMARCORESCEN Wheeling
NAVRESCEN Baltimore
NAVRESCEN South Charleston
NAVRESCEN Cumberland
NAVRESCEN Huntington
NAVMARCORESCEN Norfolk
NAVMARCORESCEN Newport News
NAVRESCEN Parkerburg
NAVMARCORESCEN Richmond
NAVMARCORESCEN Roanoke
NAVRESCEN Staunton
NAVRESCEN Lexington
NAVMARCORESCEN Louisville
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MARCORESTRACEN Lynchburg
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MARCORESTRACEN South Charleston

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Hazardous Materials Technical Center

THE HANDLING, STORAGE, AND DISPOSAL OF LITHIUM-SULFUR DIOXIDE BATTERIES

June 1984

Prepared for

Mr. Ted Zagrobelny
Environmental Quality Division
Naval Facilities Engineering Command
Code 1121A
200 Stoval Street
Alexandria, Virginia 22332

Prepared by

HAZARDOUS MATERIALS TECHNICAL CENTER
THE DYNAMAC BUILDING
11140 Rockville Pike
Rockville, Maryland 120852

ENCLOSURE (1)

THE HANDLING, STORAGE, AND DISPOSAL OF LITHIUM-SULFUR DIOXIDE BATTERIES

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THE HANDLING, STORAGE, AND DISPOSAL OF LITHIUM-SULFUR DIOXIDE BATTERIES

INTRODUCTION

Lithium-sulfur dioxide batteries are dry cell batteries commonly used in portable electronic equipment, missiles, mines, sonobuoys, and torpedoes. Lithium-sulfur dioxide batteries are more practical than carbon zinc and other types of batteries because of a longer, more constant energy output and longer shelf life. Energy is generated as an electric current from the chemical reaction between lithium and sulfur dioxide. The sulfur dioxide, under the pressurized conditions of the battery cell, is dissolved in liquid acetonitrile, which serves as the electrolyte. Acetonitrile may chemically decompose to produce cyanide which can be minimized by the production of "balanced" cells. Lithium-sulfur dioxide batteries can be classified as "balanced" or "unbalanced" depending on the ratio of lithium to sulfur dioxide. Since undischarged "balanced" cells contain a molar ratio of lithium to sulfur dioxide between 0.9 and 1.0 (typically 2.6-3.0 grams of lithium to 23.5-24.5 grams of sulfur dioxide) the constituents should deplete simultaneously as the cell is discharged. In addition, fresh cells contain 0.13-0.16 milligrams of cyanide. Unused "unbalanced" cells contain a molar ratio of lithium to sulfur dioxide between 1.4 and 1.8 (typically 4.2 grams of lithium to 24.5 grams of sulfur dioxide) and 1.6 milligrams of cyanide. Discharged "unbalanced" cells contain from 4.6 to 97.8 milligrams of cyanide, have a greater probability of explosive self-detonation, and are a documented safety hazard as the lithium can react with the electrolyte in the absence of sulfur dioxide to produce lithium cyanide, heat, and methane gas which may cause venting or rupturing. The only method of distinguishing between balanced and unbalanced cells is by referencing the National Stock Number (NSN) on the Hazardous Materials Information System (HMIS) or by contacting the manufacturer.

RESOURCE CONSERVATION AND RECOVERY ACT

The Environmental Protection Agency has concluded that lithium-sulfur dioxide batteries exhibit the characteristic of reactivity as defined in 40 CFR 261.23 in that they are readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure. Lithium-sulfur dioxide batteries contain several RCRA listed hazardous components (see Table 1). As such, facilities that generate, store, treat, or dispose of this material will be subject to all RCRA regulations governing these activities unless the small quantity generator exemption can be claimed. RCRA exempts small quantity generators from some reporting, generator, transportation, storage, treatment, and disposal regulations. 40 CFR 261.5 exempts from hazardous waste regulations all hazardous wastes from generators that generate less than 1,000 kg per month of hazardous waste or accumulate less than 1,000 kg of such waste at any time. However, when calculating the quantity of waste generated for purposes of assessing small quantity generator status, all hazardous wastes from all sources that are generated at a particular site in a one-month period or which are accumulated over any period of time must be counted. Congress is currently considering amendments to RCRA that would lower the small quantity generator exemption level. Note also that some states have different definitions of small quantity generators, for example the exemption level in Illinois is 100 kg.

HAZARDS

Since lithium-sulfur dioxide batteries have the potential to explode spontaneously, cautions should be taken in handling to minimize the hazards associated with such items. The high reactivity of lithium metal and lithium bromide, the flammability of lithium metal and the corrosivity of sulfur dioxide present in lithium-sulfur dioxide batteries also create potential hazards. Hazards of the batteries' contents are summarized in Table 1.

Health

Lithium-sulfur dioxide batteries contain several hazardous gases and have been known to explode if misused or improperly handled. Venting or rupturing of lithium-sulfur dioxide batteries produces a corrosive sulfur dioxide gas and small amounts of hydrogen cyanide which are harmful to the eyes, skin, and respiratory tract. A violent explosion of the batteries may produce airborne fragments which could cause injury. If ignited, the combustion of metallic lithium or acetonitrile may produce toxic fumes or vapors.

Environment

The leaching of hazardous components from venting lithium-sulfur dioxide batteries may contaminate surface or groundwaters as well as soil and vegetation with cyanide, lithium, and sulfite ions. These ions may present toxicity hazards and EPA has proposed surface water standards for cyanide of 4.2 micrograms per liter (average) and 22 micrograms per-liter (maximum). The 1962 United States Public Health Service guidance for cyanide in drinking water is 0.2 milligrams per liter.

Fire/Explosion

Lithium-sulfur dioxide batteries can rupture, vent, explode, and burn either spontaneously or from exposure to heat. Various chemical reactions of the batteries components may produce ignitable and potentially explosive concentrations of hydrogen or methane gas and the burning of lithium metal or acetonitrile may produce toxic gases. Even though lithium metal reacts exothermically with water, water used in conjunction with a locally applied dry graphite-based compound such as Met-L-X or Lith-X, or an approved Class D fire extinguisher, are effective methods for extinguishing burning lithium-sulfur dioxide batteries. If possible, the warehouse or storage facility should therefore be equipped with an automatic water sprinkler system or be noncombustible. Local fire department personnel should be informed of lithium-sulfur dioxide storage locations.

HANDLING

Protective Clothing

Personnel handling large quantities of lithium-sulfur dioxide batteries should wear appropriate protective equipment to prevent any contact with the batteries or leaking substances, including acid-resistant, full face shields, and acid proof gloves, aprons, and boots. Because of the explosion and fire hazards of the lithium-sulfur dioxide batteries, protective clothing should be fire resistant and static free.

Respirators

Respirators are normally not needed if the batteries are handled in a well ventilated area large enough (such as a normally ventilated warehouse) to prevent the accumulation of sulfur dioxide gas fumes leaking from defective seals. Sulfur dioxide gas can be detected by its pungent smell at concentrations well below those capable of causing injury. For continuous handling of large quantities of defective batteries or an emergency response to a massive rupture of cells, a self-contained breathing apparatus should be available.

Spill and Leak Procedures

Sand or other noncombustible absorbent materials for containing and cleaning up spills should be available as well as emergency eyewash and shower facilities. If the batteries are leaking, corroded, or bulging, they should be handled only by personnel wearing protective clothing. The materials from spills or leaks should be cleaned up using nonsparking tools, placed into a dry plastic bag which has first been purged with an inert gas, and then disposed of in an appropriate manner as described in the disposal section of this report.

STORAGE

Lithium-sulfur dioxide batteries require special storage facilities due to the flammability of lithium. They should be in a cool dry facility, segregated from other flammables by at least four feet of aisle space, not stacked excessively high, and away from personnel and vehicular traffic for added safety. The buildings used for storage should be equipped with a water sprinkler system and class D fire extinguisher or dry graphite-based compound (as mentioned earlier in the fire/explosion section of this report) for fire prevention. The batteries should be stored in an explosion proof area, and the building should be equipped with automatic detection alarms for fire, smoke and/or dangerous concentrations of toxic and flammable gases. The storage area should have adequate ventilation to dissipate gases from venting batteries.

TRANSPORTATION AND PACKAGING

Special requirements for shipping lithium-sulfur dioxide batteries have been identified in DPDS-M6050.1 and are as follows:

"(a) Transportation (depleted to less than 2 volts, and unexpended battery cells) - Depleted cells may be shipped by motor vehicle. Unexpended cells may be shipped by motor vehicle, rail freight, cargo vessel, and cargo-only aircraft. Where unexpended and depleted battery cells are comingled, they will be shipped by motor vehicle only and placarded "FLAMMABLE SOLID" if the total quantity of unexpended cells exceeds 1,000 pounds. The proper shipping name is "lithium batteries" or "lithium batteries (depleted)", as appropriate.

(b) Safety control measures (depleted cells) - Prescribed packaging for transportation is a DOT specification 12 B fiberboard box with a gross weight not to exceed 65 pounds; or any metal or fiber drum which meets the requirements of 49 CFR 173.24 (Standard require-

ments for all packages, see Appendix I). Outside packages should be marked "ORM-C", and each cell and battery must be equipped with an effective means to prevent external short circuits.

(c) Safety control measures (unexpended cells) - Packaging for transportation is prescribed as follows:

(1) Outside Containers:

For shipment by water, motor vehicle, or rail freight, the outside container must be either a (1) strong wooden box, (2) DOT Specification 12B fiberboard box (or equivalent), (3) DOT Specification 21C fiber drum (or equivalent), or (4) metal drum.

(2) Inside Containers:

(A) Cells and batteries must be packed in strong inner fiberboard containers limited to a maximum of 500 grams of lithium in one inner container. No single cell containing more than 12 grams of lithium may be shipped under this exemption.

(B) When drums are used, the inner containers must be separated from each other and all inner surfaces of the drum by at least one-inch thickness of vermiculite or equivalent of noncombustible cushioning materials.

(C) Inside boxes must be further over-packed as specified in paragraph (1) of this section.

(D) Packages must be marked as prescribed in subpart "D" of 49 CFR Part 172, Marking (see Appendix II). Packages must be labeled with the FLAMMABLE SOLID label shown in 49 CFR 172.420 (see Appendix III).

(E) Each cell and battery must be equipped with an effective means of preventing external short circuits."

On amphibious type surface ships, new and unused lithium-sulfur dioxide batteries can be stored on weather decks or below deck in their original containers. On the weather deck, a drip-proof, self-draining, ventilated metal locker must be employed, that is capable of maintaining temperatures below 130°F and contains only lithium-sulfur dioxide batteries. The locker must be isolated from other hazardous and combustible materials. Below deck, the shipping containers must be in a cool, sprinkler-protected, ventilated area isolated from other hazardous and combustible materials. Used or depleted batteries can only be stored on the weather deck with other used lithium-sulfur dioxide batteries in lockers similar to those storing new batteries.

Handling, storage, and transportation of lithium-sulfur dioxide batteries for disposal can be accomplished without significant impact on the environment. Unnecessary movement should be avoided to reduce risk. With prudence and careful handling, lithium-sulfur dioxide batteries can be accumulated and stored in a manner which greatly minimizes the potential for harm or injury.

DISPOSAL

The Defense Property Disposal Office (DPDO) is responsible for disposal of all lithium-sulfur dioxide batteries.

The DPDO will accept accountability and physical custody of balanced lithium-sulfur dioxide batteries. DPDS Manual 6050.1 states that for unbalanced lithium batteries, the DPDO will accept accountability only; the generator must maintain physical custody. However, lithium batteries that are expended or have exceeded their shelf like will be routed directly to disposal by the DPDO through a disposal contract.

The Environmental Protection Agency has concluded that lithium batteries are reactive wastes. The practical effect is that regulated quantities of these batteries may not be disposed of at most hazardous waste land disposal facilities. Sections 264.312 and 265.312 of RCRA prohibit landfilling of reactive wastes unless they are treated, rendered, or mixed such that they no longer exhibit the characteristic of reactivity and unless the general requirements for disposing reactive wastes (contained in 40 CFR 264.17(b) and 265.17(b)) have been met. These requirements state:

"(a) The owner or operator must take precautions to prevent accidental ignition or reaction of ignitable or reactive waste. This waste must be separated and protected from sources of ignition or reaction including but not limited to: open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, or mechanical), spontaneous ignition (e.g., from heat-producing chemical reactions), and radiant heat. While ignitable or reactive waste is being handled, the owner or operator must confine smoking and open flame to specially designated locations. "No Smoking" signs must be conspicuously placed wherever there is a hazard from ignitable or reactive waste.

(b) Where specifically required by other Sections of this Part, the owner or operator of a facility that treats, stores, or disposes ignitable or reactive waste, or mixes incompatible waste or incompatible wastes and other materials, must take precautions to prevent reactions which:

(1) Generate extreme heat or pressure, fire or explosions, or violent reactions;

(2) Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment;

(3) Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;

(4) Damage the structural integrity of the device or facility;

(5) Through other like means threaten human health or the environment,

(c) When required to comply with paragraph (a) or (b) of this section, the owner or operator must document that compliance. This documentation may be based on references to published scientific or engineering literature, data from trial tests (e.g., bench scale or pilot scale tests), waste analyses (as specified in 264.13), or the results of the treatment of similar wastes by similar treatment processes and under similar operating conditions."

At the present time, the opening and neutralization of the lithium-sulfur dioxide batteries for disposal in a secure landfill is the most desirable method for ultimate disposal.

Most methods for opening involve fully enclosed conveyor belts feeding guillotine cutters, hammermills, or wheeled piercing devices with scrubbers to capture sulfur dioxide gas when cell casings are opened. Electrical deactivation prior to opening, if desired, can be accomplished by submersion in a conductive aqueous solution (such as a super saturated solution of salt water), which would also absorb any heat formed by rapid discharge of the batteries. After piercing or opening, the batteries may be rendered safe by placing them in slightly acidic water. When handling the batteries in this state, personnel should wear the protective clothing described earlier in the handling section of this report. After rendering the batteries safe for a period of time proportional to the size of the opening (e.g., small opening = longer time in acidic water bath), any remaining lithium metal should be solubilized. Adequate ventilation must be provided and care must

be taken that the hydrogen gas evolved is not explosively ignited. The residual solids and solutions from any of these processes will then require disposal by methods which must comply with RCRA and other pertinent Federal and State hazardous waste regulations. Because the reactive components of the cells have been essentially neutralized, such disposal may be greatly simplified. A secure landfill, for example, may be used provided that water soluble components be solidified or chemically fixed such as concrete encapsulation prior to landfilling.

Various other physical or chemical treatment or immobilization procedures may also be used for both the solid and liquid residues. Alkaline chlorination, for example, is an effective method of oxidizing cyanides to harmless nitrogen and carbon dioxide. Liquid residue could also be deep well injected or discharged into sanitary sewers. The chemical composition of the residues and their effects upon porous rock or sand and the microbes essential to most biological sewage treatment systems must be determined before using either of the latter methods.

Incineration research is still being conducted. While some reports conclude that incineration is a suitable means for the destruction of reactive waste with minimal environmental degradation, no facilities have been permitted to date.

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TABLE I

TABLE I Hazards of Lithium-Sulfur Dioxide Battery Components

MATERIAL	IGNITABLE*	CORROSIVE*	REACTIVE*	TOXIC TO PLANTS	TOXIC TO AQUATIC ANIMALS	TOXIC TO MAMMALS OR HUMANS	AIRBORNE TOXIN OR HAZARD
Lithium metal	Yes	Yes (as LiOH)	Yes	Yes	Yes	Yes	Yes (as dust, LiOH)
Lithium ion	No	No	No	Ye-	Yes	Not highly	No
Carbon	Yes (as dust)	No	No	No	No	Yes (inhaled)	Yes (as dust)
Sulfur dioxide	No	Yes (as H_2SO_3)	No	Yes	Yes	Yes	Yes
Acetonitrile	Yes	No	Yes	Unknown	No	Not highly	Yes
Lithium bromide	No	No	No	Yes	Yes	Not highly	Yes (as dust)
Lithium dithionite	Yes	No	Yes	Yes (Li^+)	Yes (Li^+)	Not highly	Yes (as dust)
Methane	Yes	No	No	No	No	No	Yes (flammable)
Lithium cyanide and CN^-	Yes (as HCN)	No	Yes (as HCN)	Yes	Yes	Yes	Yes (as dust or HCN)
β-imino-n-butyronitrile	Yes	No	Yes	Unknown	No	Not highly	Yes

*Hazardous characteristics as defined in RCRA, 49 CFR 261.

Source: DPDS-Headquarters Environmental Assessment for the Disposal of Lithium-Sulfur Dioxide Batteries

APPENDIX I

radioactive materials, and Type B or highway route controlled quantity packages of radioactive materials (see §173.403), the shipper shall notify the consignee of the dates of shipment and expected arrival. The shipper shall also notify each consignee of any special loading/unloading instructions prior to his first shipment. For any shipment of irradiated reactor fuel, the shipper shall provide physical protection in compliance with a plan established under—

[46 FR 5298, January 19, 1981, effective February 1, 1982; 48 FR 2646, Jan. 20, 1983, effective March 1, 1983; 48 FR 10218, March 10, 1983, effective July 1, 1983]

(1) Requirements prescribed by the U.S. Nuclear Regulatory Commission, or

[46 FR 5298, January 19, 1981, effective February 1, 1982]

(2) Equivalent requirements approved by the Associate Director for Hazardous Materials Regulation, MTB.

[46 FR 5298, January 19, 1981, effective February 1, 1982]

(d) Within 90 days following acceptance by a carrier of any package containing a highway route controlled quantity of radioactive material (see §173.403(l)) for transportation by public highway, the shipper shall file the following information with the Associate Director for Hazardous Materials Regulation, MTB (this paragraph does not apply to packages shipped in compliance with physical security requirements of the U.S. Nuclear Regulatory Commission in 10 CFR Part 73):

[46 FR 5298, January 19, 1981, effective February 1, 1982; 48 FR 2646, Jan. 20, 1983, effective March 1, 1983; 48 FR 10218, March 10, 1983, effective July 1, 1983; 48 FR 13431, March 31, 1983]

(1) The route plan required under §177.825(c) of this subchapter (any supplement to the route plan prepared in accordance with §177.825(c) of this subchapter shall be filed within 90 days of receipt from the carrier);

[46 FR 5298, January 19, 1981, effective February 1, 1982]

(2) A statement identifying the name and address of the shipper, carrier and consignee; and

[46 FR 5298, January 19, 1981, effective February 1, 1982]

(3) A copy of the shipping paper or the description of the radioactive material required by §§172.202 and 172.203 of this subchapter.

[46 FR 5298, January 19, 1981, effective February 1, 1982]

§ 173.22a Use of packagings authorized under exemptions.

(a) Except as provided in paragraph (b) of this section, no person may offer a hazardous material for transportation in a packaging the use of which is dependent upon an exemption issued under Subpart B of Part 107 of this title, unless that person is the holder of or a party to the exemption.

(b) If an exemption authorizes the use of a packaging for the shipment or transportation of a hazardous material by any person or class of persons other than or in addition to the holder of the exemption, that person or a member of that class of persons may use the packaging for the purposes authorized in the exemption subject to the terms specified therein. However, no person may use a packaging under the authority of this paragraph unless he maintains a copy of the exemption at each facility where the packaging is being used in connection with the shipment or transportation of the hazardous material concerned. Copies of exemptions may be obtained from the Office of Hazardous Materials Regulation, U.S. Department of Transportation, Washington, D.C. 20590, Attention: Docket Section.

§ 173.23 Previously authorized packaging.

(a) Where the regulations specify Specification 34 polyethylene drums, a polyethylene drum manufactured and marked in accordance with a DOT exemption may be used if the polyethylene drum conforms to Specification 34 except for the specification marking required by §178.19-6(a)(2) of this subchapter and the drum is legibly marked "DOT-34" in characters at least one half inch in height in a location near the exemption marking.

[49 FR 24684, June 14, 1984, effective Oct. 1, 1984]

(b)[Removed and reserved at 49 FR 24684, June 14, 1984, effective Oct. 1, 1984]

(c) After July 2, 1982, a seamless aluminum cylinder manufactured in conformance with and for use under DOT exemption E 6498, E 7042, E 8107, E 8364, or E 8422, may be continued in use if marked before or at the time of the next retest with the specification identification "3AL" immediately above the exemption number, or the DOT mark (i.e., DOT 3AL 1800) is added in proximity to the exemption marking.

[46 FR 62452, Dec. 24, 1981, effective July 2, 1982; 47 FR 13816, April 1, 1982, effective July 2, 1982; 47 FR 26633, June 21, 1982, effective July 2, 1982]

(d) Cylinders (spheres) manufactured and marked DOT-E 6616 prior to January 1, 1983, may be continued in use if marked before or at the time of the next retest with the specification identification "4BA" near the exemption marking.

(e) After October 1, 1984, cylinders manufactured for use under exemptions DOT E-6668 or E-8404 may be continued in use, and must be marked "DOT-4L" in compliance with Specification 4L (§178. 57 of this subchapter) on or before January 1, 1986. The "DOT-4L" marking must appear in proximity to other required specification markings.

[48 FR 50444, Nov. 1, 1983; 49 FR 24306, June 12, 1984, effective Oct. 1, 1984]

§ 173.24 Standard requirements for all packages.

(a) Each package used for shipping hazardous materials under this subchapter shall be so designed and constructed, and its contents so limited, that under conditions normally incident to transportation—

(1) There will be no significant release of the hazardous materials to the environment;

(2) The effectiveness of the packaging will not be substantially reduced; and

(3) There will be no mixture of gases or vapors in the package which could, through any credible spontaneous increase of heat or pressure, or through an explosion, significantly reduce the effectiveness of the packaging.

(b) Materials for which detailed specifications for packaging are not set forth in this part must be securely packaged in strong, tight packages meeting the requirements of this section.

(c) Packaging used for the shipment of hazardous materials under this subchapter shall, unless otherwise specified or exempted therein, meet all of the following design and construction criteria:

(1) Each specification container must be marked as follows:

(i) In an unobstructued area with letters and numerals identifying the container specification (e.g., DOT-1A, DOT-17E-304HT, DOT-23C40). See § 178.0-2 of this subchapter.

(ii) The name and adress or symbol of person making the mark specified in paragraph (c)(1)(i) of this section. Symbol letters, if used, must be registered with the Associate Director for HMR. Duplicate symbols are not authorized.

[47 FR 43062, Sept. 30, 1982, effective immediately]

(iii) The markings must be stamped, embossed, burned, printed, or otherwise marked on the packaging to provide adequate accessibility, premanency, and contrast so as to be readily apparent and understood.

(iv) Unless otherwise specified, letters and numerals must be at least ½ inch high.

(v) Packaging which does not comply with the applicable specification listed in Parts 178 and 179 of this subchapter must not be marked to indicate such compliance (see § 178.0-2 and § 179.1 of this subchapter).

(2) Steel used shall be low-carbon, commercial quality steel. Stainless, open hearth, electric, basic oxygen, or other similar quality steels are acceptable. Steel sheets of specified gauges shall comply with the following:

Gage No.	Nominal thickness (inches)	Minimum thickness (inches)
12	0.1046	0.0946
13	0.0897	0.0817
14	0.0747	0.0677
15	0.0672	0.0603
16	0.0598	0.0533
17	0.0538	0.0478
18	0.0478	0.0428
19	0.0418	0.0378
20	0.0359	0.0324
21	0.0329	0.0299
22	0.0299	0.0269
23	0.0269	0.0239
24	0.0239	0.0209
25	0.0179	0.0156
26	0.0149	0.0129
28	0.0120	0.0110

(3) Lumber used shall be well seasoned, commercially dry, and free from decay, loose knots, knots that would interfere with nailing, and other defects that would materially lessen the strength.

(4) Welding and brazing shall be performed in a workmanlike manner using suitable and appropriate techniques, materials, and equipment.

(5) Packaging materials and contents shall be such that there will be no significant chemical or galvanic reaction among any of the materials in the package.

(6) Closures shall be adequate to prevent inadvertent leakage of the contents under normal conditions incident to transportation. Gasketed closures shall be fitted with gaskets of efficient material which will not be deteriorated by the contents of the container.

(7) Nails, staples, and other metallic devices shall not protrude into the interior of the outer packaging in such a manner as to be likely to cause failures.

(8) The nature and thickness of the packaging shall be such that friction during transport does not generate any heating likely to decrease the chemical stability of the contents.

(9) [Removed at 49 FR 24684, June 14, 1984, effective Oct. 1, 1984]

(d) *Polyethylene packagings and receptacles.* (1) Polyethylene used in packagings and receptacles must be of a type compatible with the lading and may not be permeable to an extent that a hazardous condition occurs during transportation, handling or refilling.

[49 FR 24684, June 14, 1984, effective Oct. 1, 1984]

(2) Each polyethylene packaging or receptacle which is used for liquid hazardous materials must be capable of withstanding without failure the procedure specified in Appendix B of this Part ("Procedure for Testing Chemical Compatibility and Rate of Permeation in Polyethylene Packagings and Receptacles") and the maximum rate of permeation of hazardous lading through or into the polyethylene packaging or receptacles may not exceed the following rates:

[49 FR 24684, June 14, 1984, effective Oct. 1, 1984]

(i) 0.5 percent for materials meeting the definition of a poison according to this subchapter and 2.0 percent for other hazardous materials, when subjected to temperatures no lower than 18°C. (64°F.) for 180 days in accordance with Test Method 1;

[49 FR 24684, June 14, 1984, effective Oct. 1, 1984]

(ii) 0.5 percent for materials meeting the definition of a poison according to this subchapter and 2.0 percent for other hazardous materials, when subjected to a temperature no lower than 50°C. (122°F.) for 28 days in accordance with Test Method 2; or

[49 FR 24684, June 14, 1984, effective Oct. 1, 1984]

(iii) 0.5 percent for materials meeting the definition of a poison according to this subchapter and 2.0 percent for other hazardous materials, when subjected to a temperature no lower than 60°C. (140°F.) for 14 days in accordance with Test Method 3.

[49 FR 24684, June 14, 1984, effective Oct. 1, 1984]

(3) Alternative procedures or rates of permeation are permitted if they yield a level of safety equivalent to or greater than that provided by paragraph (d)(2) of this section and are approved by the Associate Director for HMR.

[49 FR 24684, June 14, 1984, effective Oct. 1, 1984]

(4) Each polyethylene packaging used as an outside packaging for materials meeting the definition of a poison according to this subchapter shall be permanently marked, by embossment or other durable means, with the word "POISON" in letters of at least ¼ inch in height. Additional text or symbols may be included in the marking. The marking shall be located within six inches of the packaging's closure. The requirements of this subparagraph do not apply prior to September 1, 1985.

[49 FR 24684, June 14, 1984, effective Oct. 1, 1984]

(e) For specification containers, compliance with the applicable specifications in Parts 178 and 179 of this subchapter shall be required in all details, except as otherwise provided in this subchapter.

[Redesignated at 49 FR 24684, June 14, 1984, effective Oct. 1, 1984]

§ 173.25 Authorized packages and overpacks.

[48 FR 28095, June 20, 1983, effective Aug. 4, 1983]

(a) Except as provided in paragraph (b) of this section, authorized packages containing hazardous materials may be offered for transportation when tightly packed in a strong overpack, if all of the following conditions are met:

(1) The package meets the requirements of §§ 173.21 and 173.24 of this subchapter.

(2) The overpack is marked with the proper shipping name and identification number, and labeled as required by this subchapter for each hazardous material contained therein unless markings and labels representative of each hazardous material in the overpack are visible.

(3) Each package subject to the orientation marking requirements of § 172.312 of this subchapter is packed in the overpack with its filling holes up and the overpack is marked "THIS END UP" or "THIS SIDE UP" (as appropriate) to indicate the upward position of closures.

(4) The overpack is marked with a statement indicating that the inside (inner) packages comply with prescribed specifications when specification packagings are required, unless specification markings on the inside packages are visible.

(b) In addition to the requirements of paragraph (a) of this section, authorized packages containing corrosive liquids must meet the following conditions:

(1) Packages containing nitric acid (over 40% concentration), perchloric acid, hydrogen peroxide solution (over 52% strength by weight), nitrohydrochloric or nitrohydrochloric acid diluted are not overpacked; and

(2) Other corrosive liquids are not to be overpacked with any other hazardous material, except as follows—

(i) As provided in §§ 173.242, 173.257, 173.258, 173.259, 173.260, 173.261, and 173.286 of this subchapter; and

(ii) Acid or alkaline battery fluid in packages prescribed by §§ 173.257 and 173.258 of this subchapter may be included in overpacks with storage batteries when packed to prevent movement within the overpack.

§ 173.26 Quantity limitations and metric measurements.

(a) When quantity limitations are specified in this subchapter only by U.S. liquid measure for 110 gallons or less, or only by avoirdupois weight for 1,000 pounds or less, quantities measured in metric units may be substitut-

[Sec. 173.26(a)]

APPENDIX II

(e) A copy of the manifest bearing all required dates and signatures must be—

(1) Given to a person representing each carrier accepting the waste for transportation.

(2) Carried during transportation in the same manner as required by this subchapter for shipping papers,

(3) Given to a person representing the designated facility receiving the waste,

(4) Returned to the shipper (generator) by the carrier that transported the waste from the United States to a foreign destination with a notation of the date of departure from the United States, and

(5) Retained by the shipper (generator) and by the initial and each subsequent carrier for three years from the date the waste was accepted by the initial carrier. Each retained copy must bear all required signatures and dates up to and including those entered by the next person who received the waste.

(f) The requirements of paragraphs (d) and (e) of this section do not apply to a rail carrier when waste is delivered to a designated facility by railroad if—

(1) All of the information required to be entered on the manifest (except generator and carrier identification numbers and the generator's certification) is entered on the shipping paper carried in accordance with §174.26(c) of this subchapter;

(2) The delivering rail carrier obtains and retains a receipt for the waste that is dated by and bears the handwritten signature of the person representing the designated facility; and

(3) A copy of the shipping paper is retained for three years by each railroad transporting the waste.

(g) The person delivering a hazardous waste to an initial rail carrier shall send a copy of the manifest, dated and signed by a representative of the rail carrier, to the person representing the designated facility.

(h) A hazardous waste manifest required by 40 CFR Part 262, containing all of the information required by this subpart, may be used as the shipping paper required by this subpart.

Subpart D—Marking

§172.300 Applicability.
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(a) Each person who offers a hazardous material for transportation shall mark each package, freight container, and transport vehicle containing the hazardous material in the manner required by this subpart.

(b) When assigned the function by this subpart, each carrier that transports a hazardous material shall mark each package, freight container, and transport vehicle containing the hazardous material in the manner required by this subpart.

§172.301 General marking requirements.
[45 FR 34560, May 22, 1980, effective November 20, 1980, unless otherwise stated; redesignated at 45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(a) Except as provided by this subchapter, each person who offers for transportation a hazardous material in a packaging having a rated capacity of 110 gallons or less shall mark the package with the proper shipping name and identification number (preceded by "UN" or "NA" as appropriate) assigned to the material in §172.101 or §172.102 (when authorized).
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(1) The proper shipping name is not required to include the word "Waste" as specified by §172.101(c)(10) if the package bears the EPA marking prescribed by 40 CFR 262.32.
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(b) When it has been determined by the shipper that a package has been previously marked as required for the material it contains, it need not be remarked. (For empty packagings, see §173.29 of this subchapter.)

(c) This section does not apply to—

(1) Display of identification numbers of packages containing Limited Quantities (see §171.8 of this subchapter) or materials classed as ORM-D (see §173.1200 of this subchapter) when packed with no other hazardous material.
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(2) Display of identification numbers on packagings having a rating capacity of 110 gallons or less filled for shipment prior to July 1, 1983.
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(3) [Removed] 47 FR 43062, Sept. 30, 1982.

Note.—EPA requires special markings for hazardous wastes. See 40 CFR 262.32.
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

§172.302 Export shipments by water.

(a) Each package of hazardous material offered for export by water and described by a "n.o.s." entry in §172.101 or §172.102 (when authorized) must have the technical name or names of the material added in parentheses immediately following the proper shipping name (see §172.203(i)(2)). For example: Corrosive liquid, n.o.s. (Caprylyl chloride).
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(b) For a mixture of two or more hazardous materials, the technical name of at least two components most predominately contributing to the hazard or hazards of the mixture must be added in parentheses immediately following the proper shipping name.
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(c) [Removed] 47 FR 43062, Sept. 30, 1982.

§172.304 Marking requirements.

(a) The marking required in this subpart—(1) Must be durable, in English and printed on or affixed to the surface of a package or on a label, tag, or sign.

(2) Must be displayed on a background of sharply contrasting color;

(3) Must be unobscured by labels or attachments; and

(4) Must be located away from any other marking (such as advertising) that could substantially reduce its effectiveness.

§172.306 Consignee's or Consignor's name and address.

(a) Each package containing a hazardous material offered for transportation must be marked with the name and address of the consignee or consignor except when the package is—(1) Transported by highway and will not be transferred from one motor carrier to another, or

(2) Part of a carload lot, truckload lot, or freight container load, and the entire contents of the rail car, truck or freight container are tendered from one consignor to one consignee, or

(3) A portable tank, cargo tank or tank car.

§172.308 Authorized abbreviations.

(a) Abbreviations may not be used in a proper shipping name marking except in the following instances—
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(1) For marking descriptions of ammunition, such as Ammunition for cannon without projectile, etc., the words "with" or "without" may be abbreviated as "W" or "W/O". For example: "Ammunition for cannon W/O projectile."
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(2) The abbreviation "ORM" may be used in place of the words "Other Regulated Material."
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

§173.310 Radioactive materials.

(a) In addition to any other markings required by this subpart, each package containing radioactive materials must be marked as follows: (1) Each package of radioactive materials in excess of 110 pounds (50 kilograms) must have its gross weight plainly and durably marked on the outside of the package.

(2) Each package of radioactive materials which conforms to the requirements

for Type A or Type B packaging §173.403 of this subchapter) must be plainly and durably marked on the outside of the package in letters at least ½-inch (13 mm.) high, with the words "Type A" or "Type B" as appropriate. A packaging which is not in compliance with these requirements may not be so marked.
[48 FR 10218, March 10, 1983, effective July 1, 1983]

(3) Each package of radioactive materials destined for export shipment must also be marked "USA" in conjunction with the specification marking, or other package certificate identification. (See §173.471, 173.472, and 173.473 of this subchapter.)
[48 FR 10218, March 10, 1983, effective July 1, 1983]

172.312 Liquid Hazardous Materials

(a) Except as provided in this section, each package having an inside packaging containing liquid hazardous materials must be—
[45 FR 13087, February 28, 1980, effective September 1, 1980]

(1) Packed with closures upward, and

(2) Legibly marked "THIS SIDE UP" or "THIS END UP" as appropriate, to indicate the upward position of the inside packaging.

(b) Except as otherwise prescribed in Part 173 of this subchapter cylinders of liquefied compressed gas and specification containers 6D, 37M, 37P, and 21P are not required to be marked "THIS SIDE UP" or "THIS END UP."

(c) Arrows for purposes other than indicating proper package orientation may not be displayed on a package containing a hazardous material that is a liquid.

(1) An arrow symbol indicating "This Way Up" as specified in ANSI MH6.11968 entitled "Pictorial Marking for Handling of Goods" should be used in addition to the marking required by this section and § 173.25 of this subchapter.

(d) Except when offered for transportation by air, packages containing flammable liquids in inside packagings of one quart or less prepared in accordance with §§173.118(a) or 173.1200(a)(1) of this subchapter are excepted from the requirements of paragraph (a) of this section.
[45 FR 13087, February 28, 1980, effective September 1, 1980; 45 FR 68653, October 16, 1980, effective November 17, 1980]

(e) When offered for transportation by air, packages containing flammable liquids in inside packagings of one quart or less prepared in accordance with §§173.118(a) or 173.1200(a)(1) of this subchapter are excepted from the requirements of paragraph (a) of this section when packed with sufficient absorption material between the inner and outer packagings to completely absorb the liquid contents.
[45 FR 13087, February 28, 1980, effective immediately; 45 FR 68653, October 16, 1980, effective November 17, 1980]

§172.316 Packagings containing material classed as ORM.

(a) Each packagings having a rated capacity of 110 gallons or less and containing a material classed as ORM-A, B, C, D, or E must be plainly, durably, and legibly marked on at least one side or end with the appropriate ORM designation immediately following or below the proper shipping name of the material. The appropriate ORM designation must be placed within a rectangle that is approximately ¼ inch (6.3 mm.) larger on each side than the designation. The appropriate designation for each ORM must be:
[4. FR 34560, May 22, 1980, effective November 20, 1980; 45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(1) ORM-A for an ORM-A.

(2) ORM-B-KEEP DRY for an ORM-B that is a solid and is corrosive only to aluminum when wet.

(3) ORM-B for an ORM-B other than that described in paragraph (a)(2) of this section.

(4) ORM-C for an ORM-C.

(5) ORM-D-AIR for an ORM-D that is prepared for air shipment and packaged in accordance with the provisions of § 173.6 of this subchapter.

(6) ORM-D for an ORM-D other than that described in paragraph (a)(5) of this section.

(7) ORM-E for an ORM-E.
[45 FR 34560, May 22, 1980, effective November 20, 1980]

(b) When the ORM-D marking including the proper shipping name can not be affixed on the package surface, it may be on an attached tag.

(c) The marking ORM-A, B, C, D, or E is the certification by the person offering the package for transportation that the material is properly described, classed, packaged, marked and labeled (when appropriate) and in proper condition for transportation according to the applicable regulations of this subchapter. This form of certification does not preclude the requirement for a certificate on a shipping paper when required by Subpart C of this Part.
[45 FR 34560, May 22, 1980; effective November 20, 1980; 45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

§172.324 Hazardous substances.
[45 FR 34560, May 22, 1980, effective Nov. 20, 1980, unless otherwise stated; heading amended at 45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(a) If the proper shipping name for a mixture or solution that is a hazardous substance does not identify the constituents making it a hazardous substance, the name or names of such hazardous substance constituents as shown in §172.101 shall be entered in association with the proper shipping name on each packaging having a capacity of 110 gallons or less. This requirement also applies when descrip- ... Optional Table in §172.102 are used.
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(b) The letters RQ shall be displayed in association with the proper shipping name on a packaging having a capacity of 110 gallons or less that contains a hazardous substance.
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(c) This section does not apply prior to July 1, 1983.
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

§172.326 Portable tanks.

(a) No person may offer for transportation or transport a portable tank containing a hazardous material unless it is legibly marked withn letters or numerals, as required, measuring no less than two inches (50.8 mm.) in height—
[45 FR 34560, May 22, 1980, effective November 20, 1980]

(1) On two opposing sides with the proper shipping name of the material, and
[45 FR 34560, May 22, 1980, effective November 20, 1980]

(2) As prescribed by §172.332, with the identification number specified for the material in §172.101 or §172.102 (when authorized), and
[45 FR 34560, May 22, 1980, effective November 20, 1980; 45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(i) On each side and each end, if the tank has a capacity of 1,000 gallons or more, or
[45 FR 34560, May 22, 1980, effective November 20, 1980]

(ii) On two opposing sides in association with the proper shipping name if the tank has a capacity of less than 1,000 gallons.
[45 FR 34560, May 22, 1980, effective November 20, 1980; 45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(b) A portable tank marked with the name or identification number of a hazardous material may not be used to transport any other material unless the marking is removed, or changed to identify the hazardous material in the portable tank, whichever is appropriate.
[45 FR 34560, May 22, 1980, effective November 20, 1980]

(c) The name of the owner, or when appropriate, of the lessee, must be legibly displayed on a portable tank that contains a hazardous material.

(d) If the marking required by subparagraph (a)(2) of this section is not

visible, a transport vehicle, or freight container used to transport a portable tank must be marked on each side and each end as required by §172.332 with the identification number specified for the material in §172.101 or §172.102 (when authorized).
[45 FR 34560, May 22, 1980, effective November 20, 1980; 45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(e) Each portable tank marked as required by paragraph (a) of this section must remain marked unless it is—
[45 FR 34560, May 22, 1980, effective November 20, 1980]

(1) Filled with a material not subject to this subchapter; or
[45 FR 34560, May 22, 1980, effective November 20, 1980]

(2) Sufficiently cleaned of residue and purged of vapor to remove any potential hazard.
[45 FR 34560, May 22, 1980, effective November 20, 1980]

§172.328 Cargo tanks.

(a) Except as provided in this subpart, no person may offer for transportation or transport a hazardous material in a cargo tank unless the cargo tank is marked as required by §172.332 on each side and each end with the identification number specified for the material in §172.101 or §172.102 (when authorized).
[45 FR 34560, May 22, 1980, effective November 20, 1980; 45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(1) A person who offers a motor carrier a hazardous material for transportation in a cargo tank shall provide the motor carrier the required identification numbers on placards or shall affix orange panels containing the required identification numbers, prior to or at the time the material is offered for transportation unless the cargo tank is already marked with the identification number required by this subpart in accordance with paragraph (f) of this section and §173.29(c) of this subchapter.
[45 FR 34560, May 22, 1980, effective Nov. 20, 1980; 45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(2) A person who offers a cargo tank containing a hazardous material for transportation shall affix the required identification numbers on panels or placards prior to or at the time the cargo tank is offered for transportation unless it is already marked with identification numbers as required by this subpart.
[45 FR 34560, May 22, 1980, effective November 20, 1980]

(b) When the name of a material is required by this subchapter to be marked on a cargo tank, it must be legibly displayed on each end and each side in lettering no less than two inches (50.8 mm.) in height.
[45 FR 34560, May 22, 1980, effective Nov. 20, 1980; 45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(c) *Required markings: Gases.* Each cargo tank transporting flammable or nonflammable gas (including a cryogenic liquid) subject to this subchapter must be marked as specified in this Part on each end and each side with—
[48 FR 27674, June 16, 1983, effective Jan. 1, 1984, compliance authorized Sept. 15, 1983]

(1) The proper shipping name of the gas, or

(2) An appropriate common name for the material such as "Refrigerant Gas."

(d) *QT/NQT marking for MC 330 and MC 331 cargo tanks.* Each specification MC 330 and MC 331 cargo tank must be appropriately marked "QT" or "NQT" to indicate it is constructed of quenched and tempered steel (QT) or other than quenched and tempered steel (NQT). These markings must be placed near the specification identification plate in letters no less than two inches (50.8 mm.) in height.
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(e) A cargo tank marked with the name or identification number of a hazardous material may not be used to transport any other material unless the marking is removed, or changed to identify the hazardous material in the cargo tank, whichever is appropriate.
[45 FR 34560, May 22, 1980, effective November 20, 1980]

(f) A cargo tank that is required to be marked with the name or identification number of a hazardous material must remain marked when empty unless it is—
[45 FR 34560, May 22, 1980, effective November 20, 1980]

(1) Reloaded with a material not subject to this subchapter; or
[45 FR 34560, May 22, 1980, effective November 20, 1980]

(2) Sufficiently cleaned of residue and purged of vapor to remove any potential hazard.
[45 FR 34560, May 22, 1980, effective November 20, 1980]

§172.330 Tank cars and multi-unit tank car tanks.
[45 FR 34560, May 22, 1980, effective November 20, 1980, unless otherwise stated]

(a) No person may offer for transportation or transport a hazardous material in a tank car (other than a multi-unit tank car tank) unless the tank car is—

(1) Marked on each side, when required by Part 173 or 179 of this subchapter, with the—

(i) Proper shipping name of the material, or

(ii) Common name authorized in this subchapter for the material such as "Refrigerant Gas."

(2) Marked on each side and each end, as required by §172.332, with the identification number specified for the material in §172.101 or §172.102 (when authorized).
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(b) The letters in the marking of a proper shipping name or common name must be 4 inches (101.6 mm.) or more in height with at least a 5/8 inch (15.9 mm.) stroke. The separation between each letter must be at least ¼ inch (19.0 mm.).

(c) No person may offer for transportation or transport a hazardous material in a multi-unit tank car tank unless it is marked on opposing sides, in letters and numerals no less than two inches high, with the—

(1) Proper shipping name specified for the material in §172.101 or §172.102 (when authorized), or common name authorized for the material in this subchapter, and
[45 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(2) Identification number specified for the material in §172.101 or §172.102.

(d) A tank car or a multi-unit tank car tank marked with the identification number or name of a hazardous material may not be used to transport any other material unless the marking is removed, or changed to identify the hazardous material that the tank car or multi-unit tank car contains, whichever is appropriate.

(e) A motor vehicle or rail car used to transport a multi-unit tank car tank must be marked on each side and each end, as required by §172.332, with the identification number specified for the material in §172.101 or §172.102 (when authorized).
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(f) If a multi-unit tank car tank contains chlorine, marking of the name "Chlorine" is not required when the CHLORINE label is used as provided in §172.405(b).

(g) Each multi-unit tank car tank and each tank car (except when it contains a combustible liquid) must remain marked when empty unless—
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(1) Reloaded with a material not subject to this subchapter, or
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(2) Sufficiently cleaned of residue and purged of vapor to remove any potential hazard.
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(h) Display of identification numbers on multi-unit tank car tanks is not required prior to July 1, 1983.

§172.332 Identification number markings.
[45 FR 34560, May 22, 1980, effective November 20, 1980; 45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(a) *General:* When required by this subpart, identification numbers shall be displayed on orange panels or placards as specified in this section.

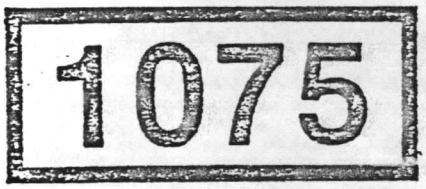
(b) *Orange panels:* Display of an identification number on an orange panel shall be in conformance with the following:

(1) The orange panel must be 6¼ inches (16 cm.) high by 15¾ inches (40 cm.) wide with a 9/16 inch (15 mm.) black outer border. The identification number shall be displayed in 4-inch (10 cm.) black Helvetica Medium numerals on the orange panel. Measurements may vary from those specified plus or minus 0.2 of an inch (5 mm).

(2) The orange panel may be made of any durable material prescribed for placards in §172.519, and shall be of the orange color specified for labels or placards in Appendix A to this Part.

(3) The name and hazard class of a material represented by the identification number may be shown in the upper left border of the orange panel in letters not more than ¼ inch (18 points) high.

(4) Except for size and color, the orange panel and identification numbers shall be as illustrated for Liquefied petroleum gas:



(c) *Placards:* Display of an identification number on a hazard warning placard shall be in conformance with the following:

(1) The identification number shall be displayed across the center area of the placard in 3½ inch (89 mm.) black Alpine Gothic or Alternate Gothic No. 3 numerals on a white background 4 inches (10 cm.) high and approximately 8½ inches (21.5 cm.) wide.

(2) The top of the 4-inch (10 cm.) high white background shall be approximately 1 5/8 inches (40.0 mm.) above the placard horizontal center line.

(3) When an identification number is displayed on a placard the United Nations hazard class number for the material shall be displayed in the lower corner of each placard as specified in §172.519(d).

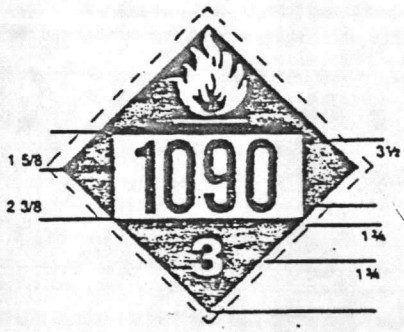
(4) For a COMBUSTIBLE placard used to display an identification number, the entire background below the white background for the identification number must be white during transportation by rail and may be white during transportation by highway.

[48 FR 28095, June 20, 1983]

(5) The name of the hazardous material and the hazard class may be shown in letters not more than ¼ inch (18 points) high immediately within the upper border of the space on the placard bearing the identification number of the material.

(6) If an identification number is placed over the word(s) on a placard, the word(s) should be substantially covered to maximize the effectiveness of the identification number.

(d) Except for size and color, the display of an identification number on a placard shall be as illustrated for Acetone:



§172.334 Identification numbers; prohibited display.

[45 FR 34560, May 22, 1980; 45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(a) An identification number may not be displayed on a POISON GAS, RADIOACTIVE or EXPLOSIVES placard.

(b) An identification number may not be displayed on an orange panel or a placard affixed to any package, freight container or transport vehicle that does not contain a hazardous material associated with that identification number in §172.101 or §172.102 (when authorized).

(c) Except as required by §172.332(c)(4) for a combustible liquid, the identification number of a material may not be displayed on a placard other than the one required by Subpart F of this Part for the material.

(d) Except as provided in §172.336, a placard bearing an identification number may may not be used to meet the requirements of Subpart F of this Part unless it is the correct identification number for all hazardous materials of the same class in the transport vehicle or freight container on which it is displayed.

(e) Except as specified in §172.338, an identification number may not be displayed on an orange panel on a cargo tank unless affixed to the cargo tank by the person offering material for transportation in the cargo tank.

(f) If a placard is required by §172.504, an identification number may not be displayed on an orange panel unless it is displayed in proximity to the placard.

§172.336 Identification numbers; special provisions and exceptions.

[45 FR 34560, May 22, 1980, effective Nov. 20, 1980; 45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(a) When not required or prohibited by this subpart, identification numbers may be displayed on a transport vehicle or a freight container in the manner prescribed by this subpart.

(b) For hazardous materials in hazard classes for which placards are not required, identification numbers may be displayed on a plain white square-on-point configuration having the same outside dimensions as those prescribed by this Part for placards. An identification number displayed as authorized by this paragraph is not considered a placard.

(1) The 4-inch (10 cm.) by 8½ inch (21.5 cm.) area containing the identification number shall be located as prescribed by §172.332(c)(2) and (c)(3) and may be outlined with a solid or dotted line border.

(c) Identification numbers are not required—

(1) On the ends of a portable tank, cargo tank or tank car having more than one compartment if hazardous materials having different identification numbers are being transported therein. In such a circumstance, the identification numbers on the sides of the tank shall be displayed in the same sequence as the compartments containing the materials they identify.

(2) On a cargo tank containing only gasoline, if the cargo tank is marked "Gasoline" on each side and rear in letters no less than 2 inches high, or is placarded in accordance with §172.542 (c).

(3) On a cargo tank containing only fuel oil, if the cargo tank is marked "Fuel Oil" on each side and rear in letters no less than 2 inches high, or is placarded in accordance with §172.544(c).

(4) For different liquid distillate fuels, including gasoline, in a compartmented cargo tank or tank car, if the identification number is displayed for the distillate fuel having the lowest flash point.

(5) For each of the different liquid distillate fuels, including gasoline, transported in a cargo tank, if the identification number displayed is for the liquid distillate fuel having the lowest flash point.

(6) On nurse tanks meeting the provisions of §173.315(m) of this subchapter.

(7) On multi-unit tank car tanks prior to July 1, 1983.

(8) [Removed] 47 FR 43062, Sept. 30, 1982.

§172.338 Replacement of identification numbers.

[45 FR 34560, May 22, 1980, effective November 20, 1980; 45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

If more than one of the identification number markings on the placards or orange panels that are required to be displayed are lost or destroyed during transportation, the carrier shall replace all the missing identification number(s) as soon as practicable. However, in such a case, the numerals may be entered legibly by hand using an indelible marking material. This section does preclude required compliance with the placarding requirements of this subchapter.

Subpart E—Labeling

§172.400 General labeling requirements.

(a) Except as otherwise provided in this subchapter, each person who offers a package, overpack, or freight container containing a hazardous material for transportation shall label it, when required, with labels prescribed for the material as specified in §172.101 or §172.102 (when authorized) and in accordance with this subpart.

[45 FR 34560, May 22, 1980, effective November 20, 1980; 45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(b) A label is not required on a—

(1) Package for which labeling is not required under the conditions set forth in this subchapter and in this section:

(2) Cylinder containing a compressed gas classed as flammable or nonflammable that is—(i) Carried by a private or contract motor carrier;

(ii) Not overpacked; and

(iii) Durably and legibly marked in accordance with CGA Pamphlet C-7, Appendix A.

(3) Package or unit of military explosives (including ammunition) shipped by or on behalf of the DOD when in (i) freight containerload, carload or truckload shipments, if loaded and unloaded by the shipper or DOD or (ii) unitized or palletized break bulk shipments by cargo vessel under charter to DOD if at least one required label is displayed on each unitized or palletized load.

[48 FR 28095, June 20, 1983]

(4) Package containing a hazardous material other than ammunition that is—(i) Loaded and unloaded under the supervision of DOD personnel, and

(ii) Escorted by DOD personnel in a separate vehicle.

(5) Compressed gas cylinder permanently mounted in or on a transport vehicle;

(6) Portable tank which is placarded in accordance with § 172.514.

(7) Freight container having a volume of 640 cubic feet or more which is subject to § 172.512;

(8) Package containing a material classed as ORM-A, B, C, D, or E if that package does not contain any other material classed as a hazardous material that requires labeling.

[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

(9) Package containing a combustible liquid; or

(10) Package of low specific activity radioactive material, when being transported in a conveyance assigned for exclusive use of the consignor under §173.425(b) of this subchapter.

[48 FR 10218, March 10, 1983, effective July 1, 1983; 48 FR 31214, July 7, 1983]

(11) Cargo tank or tank car other than a multi-unit tank car tank.

(c) Provisions of paragraph (b) do not apply to the CARGO AIRCRAFT ONLY label or the MAGNETIZED MATERIAL label.

(d) Except as provided in paragraph (b) of this section, when the proper shipping name marked on a package is a proper shipping name from §172.102 that does not appear in §172.101, the package must be labeled as provided in §172.102.

[45 FR 34560, May 22, 1980, effective November 20, 1980]

§172.401 Prohibited labeling.

(a) Except as provided in paragraphs (c) and (d) of this section, no person may offer for transportation and no carrier may transport any package bearing a label specified in this subpart unless—(1) The package contains a material that is a hazardous material, and

(2) The label represents a hazard of the hazardous material in the package.

(b) No person may offer for transportation and no carrier may transport a package bearing any marking or label which by its color, design, or shape could be confused with or conflict with a label prescribed by this part.

(c) The restrictions in paragraphs (a) and (b) of this section, do not apply to packages labeled in conformance with — (1) Any United Nations recommendation, including the class number (see §172.407), in the document entitled *"Transport of Dangerous Goods, (1970)"*;

(2) The International Maritime Organization (IMO) requirements, including the class number (see §172.407), in the document entitled "International Maritime Dangerous Goods Code"; or

(3) The ICAO Technical Instructions.

[47 FR 54817, Dec. 6, 1982, effective Jan. 1, 1983]

(d) A package containing a sample of a hazardous material, other than an explosive, must be labeled in accordance with §172.402(h).

§ 172.402 Additional labeling requirements.

(a) *Multiple labeling.* Each package containing a material meeting the definition of more than one hazard class must be labeled as follows: (1) A material classed as an Explosive A, Poison A, or Radioactive material that also meets the definition of another hazard class, must be labeled as required for each class.

(2) A Poison B liquid that also meets the definition of a Flammable liquid must be labeled POISON and FLAMMABLE LIQUID.

(3) A material classed as Oxidizer, Flammable solid or Flammable liquid that also meets the definition of a Poison B must be labeled POISON in addition to the class label.

(4) A material classed as a Flammable solid that also meets the definition of a water reactive material must have both the FLAMMABLE SOLID and DANGEROUS WHEN WET labels affixed.

(5) A material classed as a Corrosive material that also meets the definition of a Poison B shall be labeled with a POISON label in addition to the class label. This subparagraph does not apply to a material that would cause death due to corrosive destruction of tissue rather than by systemic poisoning.

[45 FR 34560, May 22, 1980, effective July 1, 1983]

(6) A material classed as a Poison B that also meets the definition of a corrosive material shall be labeled with a CORROSIVE label in addition to the class label.

[45 FR 34560, May 22, 1980, effective July 1, 1983]

(7) A material classed as a Flammable liquid that also meets the definition of a Corrosive material shall be labeled with a CORROSIVE label in addition to the class label.

[45 FR 34560, May 22, 1980, effective July 1, 1983]

(8) A material classed as a Flammable solid that also meets the definition of a Corrosive material shall be labeled with a CORROSIVE label in addition to the class label.

[45 FR 34560, May 22, 1980, effective July 1, 1983]

(9) A material classed as an Oxidizer that also meets the definition of a Corrosive material shall be labeled with a CORROSIVE label in addition to the class label.

[45 FR 34560, May 22, 1980, effective July 1, 1983]

(10) The requirements of subparagraphs (5) through (9) of this paragraph do not apply prior to July 1, 1983.

[45 FR 34560, May 22, 1980, effective November 20, 1980]

(b) *CARGO AIRCRAFT ONLY label.* Each person who offers for transportation by air a package containing a hazardous material authorized only on cargo aircraft shall affix to the package a CARGO AIRCRAFT ONLY label which is described in § 172.448.

(c) *DANGEROUS WHEN WET label.* Each person who offers for transportation a package containing a hazardous material must affix to the package a DANGEROUS WHEN WET label as described in § 172.423 when required by § 172.101.

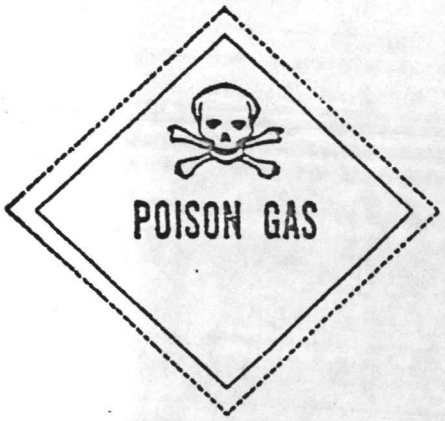
(d) *MAGNETIZED MATERIAL label.* Each person who offers for transportation by air a package meeting the definition of a magnetized material in § 173.1020 of this subchapter must affix to the package a MAGNETIZED MATERIAL

APPENDIX III

(b) In addition to the requirements specified in §172.407, the NON-FLAMMABLE GAS label must be green. The symbol and inscription must be black or white. The solid line border and, if used, the hazard class number must be the color of the symbol.
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

§172.416 POISON GAS label.

(a) Except for size and color, the POISON GAS label must be as follows:



(b) In addition to complying with § 172.407, the POISON GAS label must be white. The printing must be black, and the symbol must be black and white.

§ 172.417 FLAMMABLE GAS label.

(a) Except for size and color, the FLAMMABLE GAS label must be as follows:

(b) In addition to complying with §172.407, the FLAMMABLE GAS label must be red. The symbol and inscription must be black or white. The solid line border, and, if used, the hazard class number must be the color of the symbol.
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

§ 172.419 FLAMMABLE LIQUID label.

(a) Except for size and color, the FLAMMABLE LIQUID label must be as follows:

(b) In addition to complying with §172.407, the FLAMMABLE LIQUID label must be red. The symbol and inscription must be black or white. The solid line border, and, if used, the hazard class number must be the color of the symbol.
[45 FR 74640, Nov. 10, 1980, effective Nov. 20, 1980]

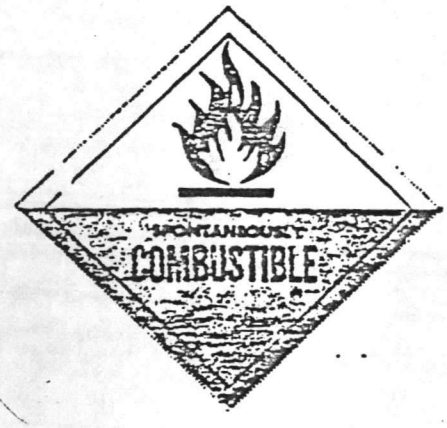
§ 172.420 FLAMMABLE SOLID label.

(a) Except for size and color, the FLAMMABLE SOLID label must be as follows:

(b) In addition to complying with § 172.407, the FLAMMABLE SOLID label must be white with vertical red stripes equally spaced on each side of a red stripin the center of the label. The rectangle for the words "FLAMMABLE SOLID" must be white. The printing and symbol must be black with the symbol overprinted. The words "FLAMMABLE SOLID" must not contact any red stripe. The white stripes must be sufficiently wider than the red stripes to make them appear visually equal in width.

§ 172.422 SPONTANEOUSLY COMBUSTIBLE label.

(a) Except for size and color, the SPONTANEOUSLY COMBUSTIBLE label must be as follows:



(b) In addition to complying with § 172.407, the SPONTANEOUSLY COMBUSTIBLE label must be red in the lower half and white in the upper half. The symbol and printing must be black.

(c) If use of the SPONTANEOUSLY COMBUSTIBLE label is required by the regulations of another country, it may e used in addition to the labels required by §§ 172.400 and 172.402.

§ 172.423 DANGEROUS WHEN WET label.

(a) Except for size and color, the DANGEROUS WHEN WET label must be as follows:

DDS

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SEP 2 1984

CORRECTED COPY

ROUTINE

R 291404Z AUG 84

FM CMC WASHINGTON DC

TO CG FMFLANT
CG LFTCLANT NORFOLK VA
MCCES TWENTYNINE PALMS CA
AIG EIGHT

CG FMFPAC
CG FOURTH FSSG
MARBKS GUANTANAMO BAY CUBA

INFO CDRCECOM FT MONMOUTH NJ //DRSEL-SF-ME/DRSEL-PE//

XMT CG MCRD ERR PARRIS ISLAND SC
HQBN HQMC ARLINGTON VA
FIRST MCD GARDEN CITY LI NY

CG MCRD WRR SAN DIEGO CA
MARBKS WASHINGTON DC
MARFINCEN KANSAS CITY MO

FAC ROUTING	ACTION	INFO	INT
FACO			
4A			
4B			
4C			
4FC			
4LC			
SEC			
CLK			

P 271400Z AUG 84

FM CDR CECOM FT MONMOUTH NJ //DRSEL-SF-ME//

TO CDR MDW WASH DC //ARLOG//
CDR TRADOC FT MONROE VA //ATPL//
CDR WESTCOM FT SHAFTER HI //APLG//
CNGB WASH DC //NGB-ARC//
CNO WASH DC //OP-04//
DALOG-ZA//
CDR INSCOM AHS VA //ILOGR//
CHIEF NGB APG MD //NGB-AVN-L//
CMC WASH DC //LMA//
AIG 9004
CDR WHITE HOUSE COMM AGENCY WASH DC //DCAU-M//
CDR FORSCOM FT MCPHERSON GA //AFLG-FMC//
DA WASH DC //DDCSLOG/ODCSRDA/DCOPS/DAAR-LOG/ODCSPER/OASA/
CDR DARCOM ALEX VA //AMCRE/AMCSM/AMCQA/AMCDE/AMCSM-PME//
CDR MICOM REDSTONE ARS AL //DRSMI-SB//
CINCUSAREUR HEIDELBERG GE //AEAGD-SMD//
CDR 200TH TAMMC ZWEIBRUECKEN GE //AEAGD-MMC-RC//
HQ AFLC WRIGHT PATTERSON AFB OH //IGY//
CDR DESCOM CHAMBERSBURG PA //DRSDS-L//
CDR US COAST GUARD WASH DC //G-CSP//
CDR USACC FT HUACHUCA AZ //CC-LOG-LD//

copy for LOG NREAD

INFO DIR FSA CHARLESTOWN IN //AMXOS-PE//
CDR MDW WASH DC //ANPE-S//
CDR TRADOC FT MONROE VA //ATEN-S//

BFAC(2)...ACT FOR CG MCB CAMP LEJEUNE(9) 17000/ 2/0369
BADJ(4) BCOS(1) BMAO(1) BSDO(1)

RECALLED/ RTD:006-127/COPIES:0009

100968/269 1 OF 5 MATA0316 269/04:14Z 271400Z AUG 84
CSN:AUIA00501 315 CDR CECOM FT M

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CDR INSCOM AHS VA //IAPER-MW//
CDR USAEIGHT SEOUL KOREA //AS-J//
CMC WASH DC //MPH-70//
CDR USACC FT HUACHUCA AZ //CC-PA-S//
DA WASH DC //DAPE-HRS//
CDR ERADCOM ADELPHI MD //DRDEL-CG//
CDR USAJ CP ZAMA JP//AJGD//
CDR USAEIGHT SEOUL KOREA//DJ-MS-SC//
DPDS BATTLE CREEK MI //DPDS-R/DPDS//
CDR FORSCOM FT MCPHERSON GA //AFPR-PSS//
CINCUSAREUR HEIDELBERG GE //AEAGA-B//
CDR WESTCOM FT SHAFTER HI //APPE-PP-SA//
CDR DESCOM CHAMBERSBURG PA //DRSDS-T//
DIR NVEOL FT BELVOIR VA //DELNV-SE//
CDR MICOM REDSTONE ARS AL //DRSMI-XO//
CDR ARMY SAFETY CENTER FT RUCKER AL //PESC-S//
CDR USAJ ZAMA JAPAN //AJGA-PSS//
CHIEF NGB APG MD //NGB-AVN-S//
HQ AFISC NORTON AFB CA //SE//
CDR DARCOM-EUROPE SECKENHEIM GE
CDR DARCOM ALEX VA //AMCSF//
DIRNSA FT MEADE MD //S23//
USACCSLA FT HUACHUCA AZ//SELCL-CO//
CDR WESTCOM FT SHAFTER HI//APLG//

UNCLAS

SECTION 01 OF 02
SUBJ: SAFETY OF USE MESSAGE, ADVISORY, TECHNICAL, BATTERY BA-5590/U, NSN 6135-01-036-3495, MANUFACTURED BY POWER CONVERSION INC(PCI).
NOTE: THIS IS A CECOM SAFETY ADVISORY MSG AND HAS NOT BEEN TRANSMITTED TO UNITS SUBORDINATE TO ADDRESSEES. ADDRESSEES SHOULD RETRANSMIT THIS MSG TO ALL SUBORDINATE UNITS, ACTIVITIES OR ELEMENTS AFFECTED OR CONCERNED. THE RETRANSMITTAL SHALL REFERENCE THIS MSG. ACTION ADDRESSEES WILL IMMEDIATELY VERIFY THIS RETRANSMISSION TO COMMANDER, CECOM, ATTN: DRSEL-SF-ME.
THIS IS A THREE PART MSG AS FOLLOWS:
PAGE 04 RUEDBIA6997 UNCLAS
PART I FOR USASC
REQUEST YOU RETRANSMIT THIS MSG VIA AIG 12197 TO INSURE THE WIDEST POSSIBLE DISSEMINATION OF THIS MSG.
PART II FOR USACSLA
REQUEST YOU RETRANSMIT THIS MSG TO YOUR CUSTOMERS WHO UTILIZE THE SUBJ BATTERY IN EQUIPMENT MANAGED BY YOUR ORGANIZATION.
PART III FOR ALL

1. WILL THE AIG 9004 PLEASE PASS THIS INFORMATION TO THE CECOM LARS.

2. A SMALL NUMBER OF BATTERIES MADE BY PCI MAY CONTAIN AN INTERNAL MANUFACTURING DEFECT WHICH, WHEN INSERTED IN EQUIPMENT, WILL MAKE THE BATTERY INOPERATIVE-AND/OR RESULT IN THE BATTERY VENTING. TO DATE, THIS CONDITION HAS BEEN OBSERVED IN A VERY FEW BATTERIES.

3. ALL SUBJECT BATTERIES MADE BY PCI MUST BE TESTED PRIOR TO USE AS FOLLOWS:
A. USING A MULTI-METER, SET TO READ VOLTAGE IN THE 0-30 VOLT RANGE (OR NEXT HIGHER RANGE), INDIVIDUALLY CHECK FOR A VOLTAGE READ-

BT

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ROUTINE

R 291404Z AUG 84

FM CMC WASHINGTON DC

TO CG FMFLANT
CG LFTCLANT NORFOLK VA
MCCES TWENTYNINE PALMS CA
AIG EIGHT
CG FMFPAC
CG FOURTH FSSG
MARBKS GUANTANAMO BAY CUBA

INFO CDRCECOM FT MONMOUTH NJ //DRSEL-SF-ME/DRSEL-PA//

XMT CG MCRD ERR PARRIS ISLAND SC
HQBN HQMC ARLINGTON VA
FIRST MCD GARDEN CITY LI NY
CG MCRD WRR SAN DIEGO CA
MARBKS WASHINGTON DC
MARFINCEN KANSAS CITY MU

P 271400Z AUG 84

FM CDR CECOM FT MONMOUTH NJ //DRSEL-SF-ME//

TO CDR MDW WASH DC //ARLOG//
CDR TRADOC FT MONROE VA //ATPL//
CDR WESTCOM FT SHAFTER HI //APLG//
CNGB WASH DC //NGB-ARC//
CNO WASH DC //OP-04//
CDR WHITE HOUSE COMM AGENCY WASH DC //DCAU-M//
CDR FORSCOM FT MCPHERSON GA //AFLG-FMC//
DA WASH DC //DDCSLOG/DDCSRDA/DCOPS/DAAR-LOG/DDCSPER/DASA/
CDR DARCOM ALEX VA //AMCKE/AMCSM/AMCQA/AMCDE/AMCSM-PME//
CDR MICOM REDSTONE ARS AL //DRSMI-SB//
CINCUSAREUR HEIDELBERG GE //AEAGD-SMD//
CDR 200TH TAMMC ZWEIBRUECKEN GE //AEAGD-MMC-RC//
HQ AFLC WRIGHT PATTERSON AFB OH //IGY//
CDR DESCOM CHAMBERSBURG PA //DRSDS-L//
CDR US COAST GUARD WASH DC //G-CSP//
CDR USACC FT HUACHUCA AZ //CC-LOG-LD//
DALOG-ZA//
CDR INSCOM AHS VA //ILOGR//
CHIEF NGB ARPC MD //NGB-AVN-L//
CMC WASH DC //LMA//
AIG 9004

INFO DIR FSA CHARLESTOWN IN //AMXOS-PE//
CDR MDW WASH DC //ANPE-S//
CDR INSCOM AHS VA //IAPER-MW//
CDR TRADOC FT MONROE VA //ATEN-S//
CDR USAJ ZAMA JAPAN //AJGA-PSS//

BFAC(2)...ACT FOR CG MCB CAMP LEJEUNE(9) 17000/ 2/0369
BADJ(4) BCOS(1) BMAO(1) BSDO(1)

RECALLED/ RTD:010-029/COPIES:0009

022457/244 3 OF 5 MATA0315 244/22:40Z 2/1400Z AUG 84
CSN:AUIA02373 CDR CECOM FT M

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CDR USAEIGHT SEOUL KOREA //AS-J//
CMC WASH DC //MPH-70//
CDR USACC FT HUACHUCA AZ //CC-PA-S//
DA WASH DC //DAPE-HRS//
CDR ERADCOM ADELPHI MD //DRDEL-CG//
CDR USAJ ZAMA JA//AJDG//
DPDS BATTLE CREEK MI //DPDS-R/DPDS//
CDR FORSCOM FT MCPHERSON GA //AFPR-PSS//
CINCUSAREUR HEIDELBERG GE //AEAGA-B//
CDR WESTCOM FT SHAFTER HI //APPE-PP-SA//
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CDR MICOM REDSTONE ARS AL //DRSMI-XO//
CDR ARMY SAFETY CENTER FT RUCKER AL //PESC-S//
CDR USACSLA FT HUACHUCA AZ//SELCL-CO//
CHIEF NGB APG MD //NGB-AVN-S//
HQ AFISC NORTON AFB CA //SE//
CDR DARCOM-EUROPE SECKENHEIM GE
CDR DARCOM ALEX VA //AMCSF//
DIRNSA FT MEADE MD //S23//
CDR USAEIGHT SEOUL KOREA//DJ-MS-SC//

UNCLAS

FINAL SECTION OF 02
ING ACROSS THE FOLLOWING SOCKET CONTACTS:
PINS 2 AND 4
PINS 1 AND 5
PINS 1 AND 2
PINS 4 AND 5

B. IF ANY VOLTAGE READING IS GREATER THAN APPROXIMATELY ZERO ACROSS ANY OF THESE PIN COMBINATIONS, DO NOT, REPEAT DO NOT USE THE BATTERY. SUBMIT A QUALITY DEFICIENCY REPORT (QDR) IAW DLAR 4155.24 AND SEND TO:

PAGE 04 RUEDBIA6998 UNCLAS

CDR, CECOM, ATTN: DRSEL-PA, FT MONMOUTH, NJ 07703-5024

C. ORGANIZATIONS/ACTIVITIES IDENTIFYING BATTERIES WHICH FAIL PARA 2B TEST WILL STORE BATTERIES IAW PARA 4 BELOW.

D. SUBMIT A COMPLETE LIST OF FAILING BATTERIES VIA MSG, INCLUDING CONTRACT NUMBER, LOT CODES, AND SERIAL NUMBERS TO:

(1) CDR, CECOM, ATTN: DRSEL-PA/DRSEL-SF, FT MONMOUTH, NJ

(2) CDR, ERADCOM, ATTN: DELET-PB, FT MONMOUTH, NJ

E. MSG MUST ALSO INCLUDE POC AND TELEPHONE NUMBER.

4. A. BATTERY STORAGE AREAS SHOULD BE DRY, AWAY FROM OPEN FLAME, HEAT AND COMBUSTIBLES. STORAGE TEMPERATURES ABOVE 130 DEGREES FAHRENHEIT SHOULD BE AVOIDED. THE AREA SHOULD HAVE ADEQUATE VENTILATION TO PREVENT THE BUILD-UP OF SULFUR DIOXIDE OR OTHER GASES FROM LEAKING BATTERIES.

B. STORAGE SHALL BE IN A SPRINKLER-PROTECTED FACILITY, IF AVAILABLE. A NONCOMBUSTIBLE BUILDING OR STRUCTURE WITHOUT SPRINKLERS WILL BE THE SECOND CHOICE. A COMBUSTIBLE STORAGE FACILITY MAY BE USED TEMPORARILY IF NEITHER OF THE ABOVE TYPES ARE AVAILABLE AT THE TIME STORAGE IS REQUIRED. HOWEVER, OTHER MORE HAZARDOUS COMMODITIES SHALL NOT BE STORED IN THE SAME AREA AS THE BATTERIES WHEN THE AREA IS NOT SPRINKLER PROTECTED.

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PAGE 05 RUEDBIA6998 UNCLAS
C. THE LOCATION OF BATTERIES MUST BE IDENTIFIED TO THE LOCAL FIRE DEPARTMENT DUE TO THE INCREASED FIRE RISK.

5. ADDITIONAL DISPOSITION GUIDANCE WILL BE PROVIDED TO THOSE ORGANIZATIONS REPORTING SUBJECT ASSETS FAILING TESTING CRITERIA.

6. POC, THIS HEADQUARTERS, IS L. SOFFER, AV 995-3112.

BT

02 05Z RR UUUU 2230845

CG SECOND MARDIV

SECOND MARDIV

INFO: CG MCB CAMP LEJEUNE

CG 2D FSSG

CG FMFLANT

I told Capt. Hillecker about the changes we recommend. Phon-con: @ 15:50 on 12 Aug 82

UNCLAS //N04790//

FOR COMMO/S-4/SUPO

PASS TO FMFLANT SCIENCE ADVISOR

SUBJ: LITHIUM BATTERY INTERIM GUIDANCE

A. MCO 10550.11 (ALO FOR AN/PRC-104)

B. MCO 2040.2 (ALO FOR KY-57/58)

C. MCO 10510.50 (ALO FOR AN/PRC-68)

1. THE REFERENCES IDENTIFY NEW RADIO AND CRYPTOGRAPHIC EQUIPMENT THAT WILL BE POWERED BY LITHIUM BATTERIES, BA-5590/U AND BA-5588/U. THE INTRODUCTION OF LITHIUM BATTERIES POSES UNIQUE HANDLING, STORAGE, TRANSPORTATION, AND DISPOSAL PROBLEMS AS WELL AS A POTENTIAL SAFETY HAZARD.

2. UNTIL GUIDANCE IS RECEIVED FROM HIGHER AUTHORITY THE FOLLOWING INFORMATION IS PROVIDED FOR ALL DIVISION UNITS:

A. HANDLING CONSIDERATIONS:

ORIG G-4

C/S, ADJ

T. W. HOYSA MAJ
FACO 2516

C. R. CASEY, LTCOL AC/S G-4 2516

DIV ENGR COPY

UNCLASSIFIED

(1) THE LITHIUM BATTERY IS A HIGH ENERGY POWER SOURCE THAT CONTAINS LITHIUM METAL, SULFUR DIOXIDE, AND ORGANIC SOLVENTS UNDER PRESSURE.

(2) THE CONTENTS ARE POTENTIALLY FLAMMABLE, EXPLOSIVE, AND/OR NOXIOUS.

(3) THE BATTERY IS PROTECTED BY A SLOW-BLOW REPLACEABLE FUSE. THIS FUSE MUST NOT BE BY PASSED OR REPLACED BY A HIGHER AMPERAGE FUSE.

(4) EACH CELL INCORPORATES A VENTING DEVICE WHICH RELEASES PRESSURE IF IT EXCEEDS 350-850 PSI NORMALLY CASUED BY OVERHEATING AND IS DESIGNED TO PREVENT THE CELL FROM RUPTURING. IF VENTING OCCURS, SULFUR DIOXIDE WILL BE RELEASED. IRRITATION TO THE EYES AND RESPIRATORY SYSTEM WILL OCCUR LONG BEFORE TOXIC CONCENTRATIONS ARE REACHED.

(5) THE LITHIUM METAL PRESENT IN THE CELLS WILL BURN WHEN EXPOSED TO AIR AND BURNING CELLS CAN CREATE HYDROGEN GAS WHEN WATER COMES IN CONTACT WITH THE CELL.

(6) IF CLASS D FIRE EXTINGUISHERS ARE NOT AVAILABLE, DRY CHEMICAL EXTINGUISHERS, BURIAL IN DRY SAND OR IMMERSION IN KEROSENE, DIESEL FUEL, VEGETABLE OIL OR ANY NEUTRAL OIL WILL EXTENGUISH THE FIRE. CARBON DIOXIDE EXTINGUISHERS ARE NOT RECOMMENDED BECASUE THEY ARE INEFFECTIVE AND POTENTIALLY HAZARDOUS.

(7) FOR THE ABOVE REASONS LITHIUM BATTERIES ARE CLASSIFIED AS

HAZARDOUS WASTE. UNDER NO CIRCUMSTANCES SHOULD THIS BATTERY BE DILIBERATELY BURNED, OPENED, CRUSHED, PUNCTURED, DISASSEMBLED OR OTHERWISE MUTILATED. or Discarded into trash receptacles/containers.

(3) IN CASE OF ACCIDENTAL MUTILATION IT IS RECOMMENDED THAT THE DAMAGED BATTERY BE STORED IN AN AIR TIGHT METAL CONTAINER THAT IS FILLED WITH A NEUTRAL OIL, E.G., A SERVICEABLE AMMUNITION CAN FILLED WITH KEROSENE.

D. STORAGE CONSIDERATIONS:

(1) LITHIUM BATTERIES SHOULD BE STORED IN THEIR ORIGINAL CONTAINERS IN A COOL, DRY, WELL VENTILATED AREA SEPARATE FROM FLAMMABLES AND OTHER POTENTIALLY HAZARDOUS MATERIALS. REFRIGERATION IS NOT REQUIRED, HOWEVER AREAS WHERE TEMPERATURES MAY EXCEED 130 DEGREES F SHOULD BE AVOIDED. BATTERIES SHOULD BE STACKED ON WOODEN PALLETS TO INCREASE VENTILATION.

(2) NEW AND USED (SERVICEABLE) BATTERIES MAY BE STORED IN OPERATIONAL COMMUNICATIONS SHOPS OR SUPPLY WAREHOUSES. OUTSIDE UNCOVERED STORAGE IS NOT DESIREABLE OR RECOMMENDED. USED (SERVICEABLE) BATTERIES SHOULD BE STORED SEPARATELY BUT CONSIDERING THE LACK OF QUALIFIED STORAGE SPACE THEY MAY BE STORED ADJACENT TO NEW BATTERIES PROVIDED THEY ARE PHYSICALLY SEPARATED BY EIGHT INCHES OF VENTILATION SPACE

AND MARKED AS USED.

(3) EXPENDED/UNSERVICEABLE BATTERIES SHOULD BE STORED IN THEIR ORIGINAL SHIPPING CONTAINERS IN AN AREA SEPARTED FROM NEW AND USED BATTERIES AND MARKED ACCORDINGLY. STORAGE ON A SEPARATE PALLET WITH A THREE FEET WALK WAY BETWEEN THE PALLET AND BULKHEADS AND OTHER MATERIALS IN THE STORAGE OR WORK SPACE IS PRESENTLY CONSIDERED ADEQUATE. IT IS RECOMMENDED THAT EXPENDED BATTERIES BE STORED NEAR A DOOR OR WINDOW FOR EASY ACCESSSBY FIREFIGHTERS.

(4) ONEE LITHIUM BATTERY STORAGE AREAS HAVE BEEN DESIGNATED, UNITS WILL CONTACT THE DIVISION ENGINEER OFFICER (PH 2755/2302) WHO WILL ENSURE EACH AREA IS INSPECTEDFFOR COMPLIANCE WITH THE ABOVE GUIDELINES. LINES AND CURRENT FIRE AND SAFETY CODES. THIS INSPECTION WILL ALSO SERVE TO IDENTIFY ADDITIONAL FACILITY REQUIREMENTS FOR ADEQUATE STORAGE.

C. DISPOSAL:

(1) UNITS WILL NOTIFY THE DIV ENG @2755/2302) BY THE LAST WORKING DAY OF EACH MONTH OF THE QUANTITY OF UNSERVICEABLE/EXPENDED BATTERIES ON HAND. NEGATIVE REPORTS ARE REQUIRED.

(2) UNITS WILL CONTACT PRESERVATION, PACKAGING, AND PACKING (PP&P) AT 5230/1628 TO ARRANGE FOR CERTIFICATION THAT THE WASTE IS PROPERLY

PREPARED FOR DISPOSAL. IN accordance with BO 6240.5 THE USING UNIT IS REQUIRED TO PICK UP CONTAINERS FROM PP&P AND TRANSPORT THE WASTE TO THE DISPOSAL SITE.

(3) UNITS WILL MAINTAINECUSTODY OF DEPLETED/DEFECTIVE BATTERIES UNTIL ~~FURTHER INSTRUCTIONS CAN BE PROVIDED.~~ the materials can be transported to Base long term Storage facilities.

D. REQUISITIONING. UNITS ARE ENCOURAGED TO MAINTAIN SUFFICIENT QUANTITIES OF BATTERIES ON HAND TO ACCOMPLISH ROUTINE TRAINING AND WALK THROUGH REQUIBITIONS FOR LARGE QUANTITIES OF BATTERIES REQUIRED FOR FIELD EXERCISES THREE TO FIVE DAYS PRIOR TOTHE EXERCISE TO PRECLUDE STORING LARGE QUANTITIES OF BATTERIES FOR LONG PERIODS OF TIME.

E. TRANSPORTATION. SINCE TACTICAL VEHICLES ARE EXEMPT FROM DEPT OF TRANSPORTATION REGULATIONS GOVERNING HAZARDOUS MATERIAL, ONLY TACTICAL VEHICLES WILL BE USED TO TRANSPORT LITHIUM BATTERIES.

3. PRESENTLY INFORMATION AVAILABLE CONCERNING POTENTIAL HAZARDS OF LITHIUM BATTERIES IS SCARCE AND SOMETIMES CONFLICTING. STRICT COMPLIANCE WITH THE INSTRUCTIONS CONTAINED IN PAR TWO ABOVE WILL MINIMIZE THE POTENTIAL FOR HAZARD. POINTS OF CONTACT ARE AS FOLLOWS: CEO, MAJ HALL 1500/1907; FACILITIES, MAJ HOYSA 2516/3295; DIV ENGR, CAPT HILLIKER 2755/2302.

LITHIUM BATTERIES

HQMC POC:

LTCOL W N LOWE
LMA-3

LITHIUM BATTERIES

BENEFITS

- HIGH CELL VOLTAGE (2x GAIN)
- HIGH ENERGY DENSITY (2-4x ZINC/MAGNESIUM)
- HIGH POWER DENSITY
- LOW TEMP PERFORMANCE (-65F VS 0F)
- FLAT DISCHARGE RATE
- SUPERIOR SHELF LIFE (5 YRS @ ROOM TEMP)

HAZARDS

- TOXIC (SULFUR DIOXIDE)
- VENT / EXPLOSION
- FLAMMABLE (None to date)

LITHIUM BATTERIES

PROBLEM AREAS

- STORAGE / PACKAGING
- TRANSPORTATION
- DISPOSAL
- OPERATIONAL USE

LITHIUM BATTERIES

STORAGE--PACKAGING PROBLEMS

- SUBJECT TO HAZARDOUS MATERIEL REGS
- FACILITIES:
  - VENTILATION - Class A storage
  - FIRE PROTECTION - flood to contain, Lithex class D extinguisher
  - SEGREGATION
- PACKAGING:
  - ORIGINAL CONTAINERS
  - ALTERNATIVE CONTAINERS (ODD LOTS, INDIV) - mekts DOT 12 B specs.
  - CONSIDERATIONS (VENTING, STABILITY/SHOCK)

INFO

- STORAGE: CMC 281402Z MAR 83
- PACKAGING: CMC 281402Z MAR 83
  CMC 301405Z MAR 83
  CMC 111402Z APR 83
  CMC 111403Z APR 83
- GENERAL: CG FMFLANT 301902Z JUN 83
  CG FMFLANT 071358Z SEP 83
  CG FMFPAC 281951Z SEP 83

LITHIUM BATTERIES

TRANSPORT PROBLEMS

- MODE:
  - AIR (DOT E-7052)
  - SEA (NAVSEAINST 9310.1_) - amphib type vessels only
  - LAND (DOT E-8441)
- BATTERY STATUS:
  - NEW
  - USED
  - DEPLETED

INFO

- AIR: HQ AFLC WPAFB OH 031215Z FEB 83
  CMC 111402Z APR 83
  CMC 111403Z APR 83
- SEA: COMNAVSEASYSCOM 04H32/HTH, 491-8020, 25MAY82
- GENERAL: CG FMFLANT 301902Z JUN 83
  CG FMFLANT 071358Z SEP 83
  CG FMFPAC 281951Z SEP 83

LITHIUM BATTERIES

DISPOSAL PROBLEMS

- DPDS POLICY:
  - BALANCED vs UNBALANCED - will not take physical custody of unbalanced
  - CONFORMING OR "MOST-NEARLY" CONFORMING STORAGE
  - BATTERY IDENTIFICATION / CERTIFICATION
  - "SAFE" TO HANDLE
- INTERNAL PROCEDURES:
  - PACKAGING
  - STORAGE - 30 lbs max
  - RESPONSIBILITIES

INFO

DPDS 101349Z FEB 83
CMC 071402Z MAR 83
CMC 281402Z MAR 83
CMC 221405Z APR 83
CG FMFLANT 071358Z SEP 83
CG FMFPAC 281951Z SEP 83

LITHIUM BATTERIES

OPNL USE PROBLEMS

- EXERCISES W/O GROUND TRANSPORT SUPPORT
- SUBMARINES (RECON OPS)
- ALTERNATIVE POWER SOURCES

INFO

CMC 101402Z MAR 83
CMC 111403Z APR 83
CG FMFLANT 301902Z JUN 83
CG FMFLANT 071358Z SEP 83
CG FMFPAC 281951Z SEP 83
CG FMFLANT 271818Z SEP 83
CMC 281402Z SEP 83
CMC 141405Z OCT 83 / 251405Z OCT 83

LITHIUM BATTERIES

INCIDENTS

- IN STORAGE
  - SYMPTOMS (LEAKAGE, BULGING CASE, ODOR)
  - PROBABLE CAUSE (HUMIDITY INDUCED CORROSION)
- IN OPERATION
  - AN/PRC-104 (CY-7875)
  - KY-57 (ZAIJ)
  - TOW-II NIGHT SIGHT BATTERY POWER CONDITIONER

ACTIONS

- USMC (REMOVAL FROM SERVICE, BATTERY CASE VENTS)
- USAR ERADCOM (INVESTIGATE CAUSES)
- USAR CECOM (BATTERY REPLACEMENT)

INFO

CMC 091403Z JUN 83
CMC 071403Z NOV 83
CMC 141405Z OCT 83 / 251405Z OCT 83

ARLINGTON ANNEX
MESSAGE CENTER

PRIORITY/ROUTINE ZYUW RUEACMC1692 3112133
P R 071403Z NOV 83
FM CMC WASHINGTON DC
TO CG FMFLANT
CG FMFPAC
CG LFTCLANT NORFOLK VA
CG FOURTH FSSG
MCCES TWENTYNINE PALMS CA
AIG EIGHT
INFO CDRCECOM FT MONMOUTH NJ //DRSEL-MMG-B/DRSEL-SF-ME/ E/
DRSEL-PC-C-TM/DRSEL-PA-QP-B//
CDRERADCOM FT MONMOUTH NJ //DELET-PB//
CDRERADCOM ADELPHI MD //DRDEL-SS//
XMT CG MCRD ERR PARRIS ISLAND SC
CG MCRD WRR SAN DIEGO CA
HQBN HQMC ARLINGTON VA
MARBKS WASHINGTON DC
FIRST MCD GARDEN CITY LI NY
MARFINCEN KANSAS CITY MO

UNCLAS //N04000//
SUBJ: SAFETY OF USE MESSAGE, ADVISORY, TECHNICAL, BATTERY BA-5590, NSN 6135-01-036-3495, CONTRACT DAAB07-81-D-6527 (PCI)
NOTE: THIS IS SAFETY ADVISORY MESSAGE THAT HAS NOT, REPEAT HAS NOT BEEN TANSMITTED TO UNITS SUBORDINATE TO ADDRESSEES. ADDRESSEES SHOULD IMMEDIATELY RETRANSMIT THIS MESSAGE TO ALL SUBORDINATE UNITS. ACTIVITES OR ELEMENTS AFFECTED OR CONCERNED.
A. CMC WASHINGTON DC 091403Z JUN 83
B. CMC WASHINGTON DC 011405Z AUG 83
C. CMC WASHINGTON DC 121402Z OCT 83
D. CMC WASHINGTON DC 131403Z OCT 83
E. CMC WASHINGTON DC 141403Z OCT 83
F. CMC WASHINGTON DC 181402Z OCT 83
G. CMC WASHINGTON DC 011403Z NOV 83
1. TAKE FOLLOWING ACTION IMMEDIATELY:
A. ADD LOT 0183, REPEAT 0183, OF CONTR DAAB07-81-D-6527 TO LOTS IDENT AS POTENTIALLY DEFECTIVE BY THE REFS.
B. COMPLY WITH REF A REMOVAL FROM GENERAL SERVICE, DISPOSAL OR STORAGE, SAFETY, HANDLING, INVENTORY, PACKAGING AND REPORTING INSTRUCTIONS FOR ADDED LOT (0183, CONTR DAAB07-81-D-6527).
2. REQUEST REPORTS ON ABOVE LOT BE SUBMITTED ASAP AND NLT 25 NOV 83. INFO IS REQUIRED TO ASSIST IN ARMY/MFR NEGOTIATIONS.
3. FOLLOWING IS A RECAP OF BA-5590 BATTERY MFR LOTS WHICH HAVE BEEN REMOVED FROM GENERAL SERVICE BY THE REFS AND THIS MSG:

CONTR	MFR LOT/DATE	REF
DAAB07-80-D-6502 (MALLORY) ✓	1080 ✓ - Most	A
	1180	A
	1280	A
DAAB07-80-D-6504 (PCI) ✓	1081 ✓	G
	1281	E
DAAB07-81-D-6526 (DURACELL) ✓	1181 ✓	A
	1281	F
	0182	C
	0282	A
	0382 ✓	A
	0482	B
DAAB07-81-D-6527 (PCI)	0982	D
	1082	D
	1182	F
	0183	THIS MSG

4. HQMC POC IS LTCOL W. N. LOWE, LMA-3, (A) 224-2039. BT

CMC WASH DC
ACTION L(5)
INFO CC(1) POC(1) TFK CK(1)

8

(D,6)

MCN=83311/20886 TOR=83311/2132Z TAD=83311/2137Z CDSN=MAB504

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE ZYUW RUEACMC7801 3002203
R 251405Z OCT 83
FM CMC WASHINGTON DC
TO CG FMFLANT
INFO CG FMFPAC CGMCDEC QUANTICO VA
CG MCLB ALBANY GA
CDRCECOM FT MONMOUTH NJ//DRSEL-MMG-B/DRSEL-SF-ME/
DRSEL-PC-C-TM//
CDRERADCOM FT MONMOUTH NJ//DELET-PB//
CDRERADCOM ADELPHI MD //DRDEL-SS//
TWO FOUR MAU
DIRNSA FT GEORGE G MEADE MD //S82//

UNCLAS //N04400//
FOR G4, CEO, INFO: A800
SUBJ: LITHIUM BATTERY INCIDENTS
A. CMC WASHINGTON DC 141405Z OCT 83 (NOTAL)
1. PARA 4. OF THE REF DISCUSSES RECENT INCIDENTS AND LOCALLY DEVISED OPERATOR PROTECTION METHODS (I.E. SANDBAGGING OF OPERATING EQUIP).
2. LOCALLY DEVISED METHODS ARE NOT, REPEAT NOT, TO INCLUDE MODIFICATION OF ZAIJ OR CY-7875 BATTERY CONTAINERS. WE ARE COORDINATING WITH BATTERY CONTAINER DEVELOPERS/MANUFACTURERS TO DEVELOP APPROPRIATE MODIFICATION KITS AND INSTRUCTIONS. DETAILED INFO ON KITS/INSTR AND AUTH TO IMPLEMENT MOD(S) WILL BE DISSIMINATED WHEN AVAIL.
3. CMC POC IS LTCOL W. N. LOWE, LMA-3, AV 224-2039. BT

CMC WASH DC
ACTION L(5) (D,6) 7
INFO POC(1) TFK CK(1)

MCN=83300/28966 TOR=83300/2203Z TAD=83300/2203Z CDSN=MAB020

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE ZYUW RUEACMC4278 2902030
R 141405Z OCT 83
FM CMC WASHINGTON DC
TO CG FMFLANT
INFO CG FMFPAC CGMCDEC QUANTICO VA
CG MCLB ALBANY GA
CDRCECOM FT MONMOUTH NJ //DRSEL-MMG-B/DRSEL-SF-ME/
DRSEL-PC-C-TM//
CDRERADCOM FT MONMOUTH NJ //DELET-PB//
CDRERADCOM ADELPHI MD //DRDEL-SS//
TWO FOUR MAU

UNCLAS //N04400//
FOR: G4, CEO, INFO: A800
SUBJ: LITHIUM BATTERY INCIDENTS
A. CG SECOND MARDIV 121500Z OCT 83 (NOTAL)
B. TWO FOUR MAU 131313Z OCT 83 (NOTAL)
C. SECOND TKBN 111500Z OCT 83 (NOTAL)
1. WE VIEW WITH EXTREME CONCERN THE RECENT BA-5590 LITHIUM BATTERY INCIDENTS REPORTED BY THE REFS. THE INCIDENTS, AS REPORTED, INDICATE THAT WE ARE FACED WITH A PROBLEM SIGNIFICANTLY GREATER THAN THAT PREVIOUSLY IDENTIFIED. THE US ARMY'S ERADCOM IS EXPENDING MAXIMUM EFFORT TOWARDS DETERMINING THE CAUSE(S) OF THE INCIDENTS/DEFECTS AND DURACELL HAS INDICATED A DEGREE OF WILLINGNESS TO REPLACE THE BATTERIES WHICH WE HAVE PREVIOUSLY REPORTED AS DEFECTIVE. HOWEVER, ERADCOM'S ABILITY TO INVESTIGATE SUCH INCIDENTS AS THOSE REPORTED BY THE REFS IS HAMPERED BY OUR INABILITY TO PROVIDE RESIDUE TO THEM OM A TIMELY BASIS AND THEIR INABILITY, TO DATE, TO "CREATE" LIKE PROBLEMS IN A LAB ATMOSPHERE. WE, ERADCOM, AND THE BATTERY MANUFACTURERS WILL CONTINUE OUR EFFORTS TO DISCOVER BATTERY DEFECT CAUSES AND DEVISE METHODS TO ENHANCE BATTERY SAFETY/STABILITY FACTORS.
2. IN THE INTERIM, WE WILL CONTINUE TO REMOVE MFR LOTS FROM GENERAL SERVICE WHENEVER REPORTED INCIDENTS INDICATE THAT OTHER BATTERIES FROM A GIVEN LOT MAY HAVE BEEN SUBJECTED TO LIKE CIRCUMSTANCES (I.E. MANUF PROCESS, TRANSPORT, STORAGE, ETC.) AND SHOULD BE AFFORDED ADDITIONAL PROTECTION/CARE. WE REGRET THE IMPOSITION OF ANY ADDITIONAL WORKLOAD INVOLVED IN THE INVENTORY, STORAGE AND REPORTING PROCESS. HOWEVER, LOCAL HOLDER DEVELOPMENT OF RUNNING INVENTORIES (BY CONTR, MANUF DATE/LOT, AND BTRY SER NO.) AND STORAGE OF BATTERIES IN CONTR/LOT SEQUENCE SHOULD MINIMIZE THESE DIFFICULTIES.
3. IT IS REITERATED THAT THE BA-5590'S REMOVED FROM GENERAL SERVICE MAY BE UTILIZED TO MEET CRITICAL OPERATIONAL REQUIREMENTS. SUCH BATTERIES SHOULD BE CAREFULLY INSPECTED PRIOR TO USE, BE HANDLED WITH CARE AND OPERATOR PERSONNEL MADE AWARE OF THEIR STATUS.
4. WHEN THE OPNL SECNARIO PERMITS, EVERY EFFORT MUST BE MADE TO USE THE ALTERNATE BATTERY(BB-590) PRIOR TO UTILIZING THE BA-5590, ESPECIALLY WHEN THE EQUIP AND OPERATOR ARE TO BE IN DIRECT PROXIMITY. WE ARE TAKING ACTION TO ALLEVIATE FMFLANT DEPLOYED-UNIT BATTERY RECHARGE DIFFICULTIES IN THE NEAR FUTURE (TO BE DISCUSSED BY SEP CORRESP). IN THOSE CASES WHEREIN BA-5590'S MUST BE USED, THE CAUTIONS NOTED IN PARA 3. ABOVE APPLY. FURTHER, LOCALLY DEVELOPED METHODS OF PROVIDING ADDITIONAL PROTECTION TO PERSONNEL IN PROXIMITY TO THE BATTERIES (I.E. SANDBAGGING AROUND EQUIP) IS ENCOURAGED. IT SHOULD BE NOTED, HOWEVER, THAT THE INCIDENTS REPORTED TO DATE INDICATE THAT THE BATTERIES VENTED PROPERLY, BUT THE KY-57 AND PRC-104 BATTERY CASES DID NOT ALLOW RAPID DISSIPATION OF THE VENTED GASSES, THUS THE CASES THEMSELVES BECAME AN INTEGRAL PART OF THE HAZARD. ACCORDINGLY, LOCALLY DEVISED PROTECTION METHODS/MATERIELS SHOULD BE SO DESIGNED AS TO ALLOW RAPID DISSIPATION OF ANY VENTED GASSES
5. HQMC POC IS LTCOL W. N. LOWE (CODE LMA-3) (AV) 224-2039. BT

See CMC 251405Z Oct 83

CMC WASH DC 7
ACTION L(5) (D,6)
INFO POC(1) TFK CK(1)

MCN=83290/18583 TOR=83290/2030Z TAD=83290/2030Z CDSN=MAC572
PAGE 1 OF 1
141405Z OCT 83

UNCLASSIFIED

ROUTINE ZYUW RUHQSGG3147 2721037
R 2819517 SEP 83
FM CG FMFPAC
TO AIG ONE FIVE ONE AIG ONE FOUR FIVE
AIG ONE FOUR FOUR
INFO CMC WASHINGTON DC CG FMFLANT

UNCLAS//N02900//THIS IS A CG FMFPAC/COMMARCORBASESPAC MSG
SECTION 01 OF 02 //N02900//
CMC FOR CODE LMA-3; OTHERS FOR CEO
SUBJ: LITHIUM BATTERIES
A. CMC WASHINGTON DC 281402Z MAR 83 PASEP
B. CMC WASHINGTON DC 301405Z MAR 83 PASEP
C. COMNAVSEASYSCOM LTR 04H32/HTH/SER 491 8020 OF 25MAY82 PASEP
D. DOT-E 7052 (11TH REVISION) PASEP
E. DOT-E 8441 PASEP
F. CMC WASHINGTON DC 111402Z MAR 83 PASEP
G. CMC WASHINGTON DC 111403Z APR 83 PASEP
H. CMC WASHINGTON DC 081403Z MAR 83 PASEP
I. CMC WASHINGTON DC 241402Z JAN 83 PASEP
J. CG FMFPAC 201934Z APR 83 PASEP
K. NAVSEAINST 9310.1A PASEP
1. SINCE THEIR INTRODUCTION INTO THE MARINE CORPS INVENTORY, THE LITHIUM SULFUR-DIOXIDE (LI-SO2) BATTERY HAS BEEN THE SUBJECT OF EXTENSIVE CORRESPONDENCE. IN A ATTEMDT TO MINIMIZE THE CONFUSION ASSOCIATED WITH THE (LI-SO2) BATTERY, THIS MSG IS PROVIDED AS AN INTERIM SINGLE SOURCE DOCUMENT FOR HANDLING, STORAGE AND DISPOSAL OF THESE BATTERIES PENDING PUBLICATION OF MCO ON SUBJECT.

A. STORAGE AND HANDLING ASHORE. REFS A AND B PERTAIN.

(1) BATTERIES SHALL BE STORED IN ORIGINAL OR SIMILAR PACKAGING IN A COOL VENTILATED SHELTER (SPRINKLER PROTECTED IF FEASIBLE).

(2) TEMPS EXCEEDING 130 DEGREES SHOULD BE AVOIDED.

(3) ALL BATTERY STORAGE AREAS SHALL BE EQUIPPED WITH A CLASS "D" EXTINGUISHER.

(4) NO OTHER MATERIAL OR COMMODITY WILL BE STORED IN THE SAME STACK WITH THE BATTERIES.

45) SMOKING IS STRICTLY PROHIBITED IN BATTERY STORAGE AREAS.

(6) QTY OF EXPENDED BATTERIES WILL BE TURNED INTO DPDO AT LEAST EVERY 30 DAYS OR UPON ACCUMULATION OF 30 LBS WHICHEVER OCCURS FIRST

B. STORAGE AND HDLG ABOARD SURFACE SHIPS. REFS C & K PERTAIN.

(1) NEW BATTERIES MAY BE STORED EITHER ON WEATHER DECKS OR BELOW DECKS.

(2) QUANTITY WILL BE KEPT TO A REASONABLE MINIMUM.

(3) WEATHER DECK STORAGE WILL BE IN JETTISONABLE DRIP PROOF LOCKERS.

(4) BELOW DECK STORAGE SHOULD BE IN COOL, SPRINKLER PROTECTED, VENTILATED AREA. ISOLATED BY UTILIZING EQUIVALENT BARRIERS TO THOSE USED TO SEPARATE STOWS OF LFORM AMMO.

(5) USED BATTERIES WILL BE STORED ON WEATHER DECK ONLY.

(6) EQUIPMENTS WITH LITHIUM BATTERIES INSTALLED NOT ALLOWED IN BERTHING SPACES.

(7) BATTERIES SHOULD BE OFF LOADED AT EARLIEST POSSIBLE TIME BUT NOT DURING AMMUNITION OR REFUELING EVOLUTIONS.

C. TRANSPORTATION OF LITHIUM BATTERIES. THERE ARE NUMEROUS REGULATIONS WHICH AUTHORIZE/RESTRICT TRANSDORTATION OF LITHIUM BATTERIES VIA DIFFERENT MODES. THE FOLLOWING IS A SUMMATION OF THOSE REGULATIONS. READ IN TWO COLUMNS.

TRANS MODE	APPLICABLE REF/REFS
AMPHIB SHIPPING	C, K
SUBMARINE	C
COMM AIR	D, E
MOTOR FREIGHT	D, E
MILITARY TACTICAL VEHICLE	D, E
COMM SHIPPING	D, E
RAIL	D, E
MAC AIR	F, G, H
USMC AIR	G, I, J

D. SAFETY IN HANDLING LITHIUM BATTERIES.

(1) A LITHIUM BATTERY IS A HIGH ENERGY ELECTRIC POWER SOURCE CONSISTING OF 10 HERMETICALLY SEALED STAINLESS STEEL CASED CELLS. EACH CELL CONTAINS LITHIUM METAL, SULFUR DIOXIDE (SO2) GAS, AND ORGANIC SOLVENTS UNDER PRESSURE (30 TO 60 POUNDS PER SQUARE INCH ATMOSPHERIC (PSIA).) THE CONTENTS ARE POTENTIALLY FLAMMABLE AND/OR NOXIOUS.

(2) THE LITHIUM BATTERY IS PROTECTED BY A 3.2 AMPERE SLOW BLOW REPLACEABLE FUSE IN EACH 12-VOLT SECTION TO PROTECT AGAINST EXCESSIVE CURRENTS OR EXTERNAL SHORT CIRCUITS WHICH COULD LEAD TO OVERHEATING, CELL VENTING, OR CELL RUPTURE. THIS FUSE WILL NOT BE BYPASSED OR REPLACED WITH A HIGHER RATED FUSE.

(3) EACH CELL INCORPORATES A VENTING DEVICE WHICH RELEASES INTERNAL PRESSURE TO AMBIENT PRESSURE IF THE INTERNAL PRESSURE EXCEEDS 350 TO 450 PSIA (NORMALLY CAUSED BY OVERHEATING (200, TO 222 DEGREES F)), IN ORDER TO PREVENT THE CELL FROM RUPTURING. IF A CELL VENTS, SULFUR DIOXIDE GAS, A NOXIOUS EYE AND RESPIPRATORY IRRITANT, WILL BE RELEASED. IRRITATION WILL OCCUR LONG BEFORE TOXIC CONCENTRATIONS ARE REACHED.

(4) THE LITHIUM BATTERY CONTAINS PRESSURIZED CELLS SIMILIAR TO AEROSOL CANS; THEREFORE, UNDER NO CIRCUMSTANCES SHOULD THE BATTERY BE DELIBERATELY OPENED, CRUSHED, PUNCTURED, DISASSEMBLED OR OTHERWISE MUTILATED IN ANY WAY WHICH COULD RESULT IN A POSSIBLE CELL RUPTURE.

(5) LITHIUM BATTERIES SHOULD BE NOT BE HEATED. OVERHEATING MAY PRODUCE INTERNAL PRESSURE AT A RATE IN EXCESS OF THE VENTING CAPACITY AND COULD RESULT IN A CELL OR BATTERY RUPTURE.

(6) UNDER NO CIRCUMSTANCES SHOULD RECHARGING OF THE BATTERIES BE ATTEMPTED, AS SUCH ACTION COULD LEAD TO VENTING, RUPTURE, OR RUPTURING WITH FIRE.

(7) A THERMAL CURRENT INTERRUPTER IS BEING INCORPORATED INTO LITHIUM BATTERIES TO SHUT DOWN BATTERY OPERATION IF THE INTERNAL TEMP EXCEEDS 191 DEGREES F.

(8) THE LITHIUM METAL RESIDENT IN LITHIUM BATTERIES WILL BURN WHEN EXPOSED TO AIR AND CAN NOT BE EXTINGUISHED BY WATER IF THE QUANTITY OF LITHIUM EXPOSED IS SIGNIFICANT; I.E., IF MANY CELLS ARE VENTED AND OPENED. LITHIUM FIRES ARE EXTINGUISHABLE WITH A CLASS D FIRE EXTINGUISHER. IF NOT AVAIL, DRY CHEMICAL EXTINGUISHERS OR BURIAL IN DRY SAND WILL EXTINGUISH THE FIRE. CARBON DIOXIDE EXTINGUISHERS HAVE BEEN FOUND TO BE INEFFECTIVE IN LITHIUM FIRES AND ARE NOT RECOMMENDED AS THEY ARE POTENTIALLY HAZARDOUS. A FINE SPRAY OF WATER IN SUFFICIENT AMOUNTS SO AS TO FLOOD THE BURNING MATERIALS MAY BE USEFUL. THIS WILL NOT ONLY TEND TO CUT OFF AIR ACCESS TO THE FIRE BUT WILL COOL DOWN THE BATTERIES AND SURROUNDING COMBUSTIBLES SO THAT FURTHER CELL VENTING AND BURNING ARE MINIMIZED. IN ANY EVENT, EFFORTS SHOULD BE AIMED AT PREVENTING THE SPREAD OF THE FIRE TO OTHER COMBUSTIBLES.

(9) AIR RESPIRATORS OR SELF-CONTAINED BREATHING APPARATUS APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND BT

(continued on reverse)

CMC WASH DC
COG L-S(11) (M,C)
INFO TFK CK-S(1)

MCN=83272/11388 TOR=83272/1040Z TAD=83272/1057Z CDSN=MAC083

ROUTINE ZYUW RUHQSGG3148 2721037
R 281951Z SEP 83
FM CG FMFPAC
TO AIG ONE FIVE ONE AIG ONE FOUR FIVE
AIG ONE FOUR FOUR
INFO CMC WASHINGTON DC CG FMFLANT

UNCLAS
FINAL SECTION OF 02 //NG2900//
HEALTH (NIOSH) SHALL BE WORN WHEN ENTERING STORAGE SPACES WHERE LITHIUM BATTERIS ARE VENTING OR HAVE VENTED.
E. THE FOLLOWING PROCEDURES SHOULD BE OBSERVED WHEN LITHIUM BATTERIES ARE USED.

(1) PRIOR TO ANY HANDLING/USAGE, LITHIUM BATTERIES SHOULD BE VISUALLY INSPECTED FOR ANY INDICATION OF DETERIORATION, MOISTURE WITHIN OR INFLATION OF THE PLASTIC WRAP/BAG, OR PUNGENT ODOR. DO NOT USE THE BATTERY IF ANY OF THESE CONDITIONS EXIST.

(2) BATTERIES ARE TO BE OPENED CAREFULLY IN A WELL VENTILATED AREA AND ARE TO BE HELD AWAY FROM THE FACE WHEN REMOVING THE PLASTIC BAG/WRAP.

(3) AFTER BATTERY INSTALLATION, IF AN OPERATOR DETECTS THE BATTERY COMPARTMENT BECOMING HOT, HEARS CELLS VENTING (HISSING SOUND), OR SMELLS THE IRRITATING PUNGENT GAS, THE FOLLOWING IMMEDIATE ACTIONS WILL BE PERFORMED:

(A) TURN OFF THE EQUIPMENT.

(B) MOVE PERSONNEL OUT OF THE IMMEDIATE AREA

(C) ALLOW ONE HOUR FOR THE BATTERY TO COOL. IF THE BATTERY IS NOT COOL TO THE TOUCH MORE TIME WILL BE NECESSARY.

(D) WHEN THE BATTERY IS COOL TO THE TOUCH, CAREFULLY REMOVE IT FROM THE EQUIPMENT. (USE OF GLOVES AND PROTECTIVE MASK IS RECOMMENDED).

(E) PACKAGE THE FAULTY BATTERY IN A PLASTIC BAG (SEALING THE BAG WITH TAPE) AND RETURN TO ORIGINAL FIBERBOARD SHIPPING CONTAINER OR EQUIVALANT PROTECTION. IF THE BATTERY CANNOT BE REMOVED FROM THE EQUIP, PROVIDE LIKE PACKAGING/PROTECTION FOR THE EQUIPMENT.

(F) SEGREGATE THE BATTERY/EQUIP TO PREVENT UNDUE HANDLING OR HAZARD TO PERSONNEL AND REPORT THE INCIDENT/CIRCUMSTANCES AS INDICATED IN FOLLOWING PARA.

F. LITHIUM BATTERY INCIDENT REPORTS. A REPORT WILL BE SUBMITTED TO THE OPERATIONAL COMMANDER WITH INFO COPIES TO CG FMFPAC (CEO) CG FMFLANT (CEO), AND CMC (CODE LMA-3) WHENEVER A LEAKAGE, VENTING, OR RUPTURE OF A LITHIUM BATTERY OR CELL IS DISCOVERED/OCCURS. THE FOLLOWING DETAILS WILL BE PROVIDED AS A MINIMUM:

(1) TYPE OF BATTERY INVOLVED
(2) MANUFACTURER (MFR) OF BATTERY.
(3) CONTRACT LOT NUMBER.
(4) MFR DATE.
(5) BATTERY SERIAL NUMBER.
(6) CIRCUMSTANCES.
(7) PRESENT LOCATION/DISPOSITION OF THE BATTERY.
(8) POINT OF CONTACT FOR ADDITIONAL INFORMATION.

G. CUSTODY OF LITHIUM BATTERIES. POSITIVE PROCEDURES WILL BE ESTABLISHED TO ENSURE THAT THE FOLLOWING TYPES OF EVENTS CANNOT OCCUR.

(1) USED LITHIUM BATTERIES BEING REMOVED FROM THE WORKING AREA INTO RESIDENTIAL AREAS.

(2) USED LITHIUM BATTERIES BEING IMPROPERLY DISCARDED IN THE FIELD.

(3) USED LITHIUM BATTERIES REMAINING IN THE WORKING AREAS INSTEAD OF BEING TURNED INTO SUPPLY FOR DISPOSAL.

H. STORAGE OF NEW BATTERIES IN A FIELD ENVIRONMENT. THE PROVISIONS OF PARA 1.A ABOVE APPLY.

I. STORAGE OF USED LITHIUM BATTERIES IN GARRISON. THE PROVISIONS OF PARA 1.A SHALL BE FOLLOWED WITH THE FOLLOWING EXCEPTIONS:

(1) USED/DEPLETED LITHIUM BATTERIES ARE TO BE SEGREGATED FROM NEW LITHIUM BATTERIES.

(2) USED BATTERIES SHALL BE INDIVIDUALLY SEALED IN A PLASTIC BAG OR WRAPPED IN ELECTRIC INSULATING TAPE. THEY WILL BE STORED IN A WOODEN BOX OR FIBERBOARD CONTAINER OF THE SAME OR GREATER CONSTRUCTION AS THE ORIGINAL SHIPPING CONTAINERS (RECOMMEND SAVING THE ORIGINAL CONTAINERS FOR THIS PURPOSE).

2. DISPOSAL OF LITHIUM BATTERIES. USED/DEPLETED LITHIUM BATTERIES WILL NOT BE STORED IN EXCESS OF THIRTY DAYS NOR SHOULD TOTAL QTY WEIGHT EXCEED THIRTY POUNDS WHILE AWAITING DISPOSAL IAW REF A. THE MEANS OF DISPOSING OF USED/DEPLETED LITHIUM BATTERIES WILL BE DISCUSSED IN THIS PARAGRAPH. ACCOUNTABILITY OR DOCUMENTATION PROCEDURES WILL BE IAW STANDARD SUPPLY PROCEDURES.

A. DISPOSAL WITHIN CONUS. USED/DEPLETED LITHIUM BATTERIES WILL BE TURNED IN TO THE NEAREST DEFENSE PROPERTY DISPOSAL OFFICE (DPDO) ACTIVITY. THE BATTERIES MUST BE PROPERLY IDENTIFIED, BE PROPERLY PACKAGED, BE OF BALANCED CELL DESIGN AND CERTIFIED AS SUCH.

B. DISPOSAL AT SEA. IAW REF K, USED/DEPLETED LITHIUM BATTERIES MAY BE DISPOSED OF AT SEA PROVIDING THE VESSEL IS OVER 50 MILES FROM SHORE AND THE DEPTH OF THE WATER IS IN EXCESS OF 500 FEET. REF K FURTHER STATES THAT BATTERIES WILL NOT BE STORED ABOARD SHIP FOR DISPOSAL ASHORE.

C. DISPOSAL GUIDELINES OUTSIDE OF CONUS.

(1) DISPOSAL IAW HOST NATION SUPPORT AGREEMENTS IS THE PREFERRED METHOD.

(2) THE NEXT PREFERRED METHOD IS TO TURN THE BATTERIES INTO A LOCAL DPDO ACTIVITY IF POSSIBLE.

(3) BATTERIES SHOULD BE RETROGRADED TO AMPHIBIOUS SHIPPING FOR DISPOSAL AT SEA IF THE ABOVE LISTED METHODS ARE NOT POSSIBLE.

(4) UNITS BEING DEPLOYED/REDEPLOYED BY MAC AIRLIFT SHOULD USE AN ALTERNATE POWER SOURCE (I.E. BB 590) IF POSSIBLE, WHEN HOST NATION DISPOSAL, A DPDO ACTIVITY OR AMPHIBIOUS SHIPPING ARE UNAVAILABLE TO DISPOSE OF USED LITHIUM BATTERIES. HOWEVER, IF LITHIUM BATTERIES MUST BE USED THE FOLLOWING METHOD OF DISPOSAL MAY BE UTILIZED ONLY AS A LAST RESORT:

(A) DISPOSAL WILL BE ACCOMPLISHED BY BURNING. A PIT TWO FEET DEEP AND OF SUFFICIENT SIZE TO PLACE A USED AMMO CAN IN WILL BE USED. THE AMMO CAN SHOULD BE FILLED WITH HEAT TABS TO BURN THE BATTERIES. A SMALL GRILL OVER THE AMMO CAN TO EXPEDITE BURNING IS RECOMMENDED. ONCE BURNING IS COMPLETE THE BATTERY REMAINS SHOULD BE BURIED IN THE PIT.

(B) SAFETY CONSIDERATIONS. PERSONNEL BURNING THE BATTERIES SHOULD WEAR PROTECTIVE MASK AND REMAIN UPWIND. BURNING SHOULD TAKE PLACE IN AN ISOLATED AREA AWAY FROM PEOPLE.

3. REQ WIDEST DISSEMINATION OF THE CONTENTS OF THIS MSG TO ALL PERSONNEL CONCERNED. RETAIN THIS MSG IN TURNOVER FILES OF MMO, COMMO AND SAFETY O.

4. POC THIS HQ: FMFPAC CEO MGSGT ROYAL AVN/COM 477-5010/5011. BT

CMC WASH DC
COG L-S(11)
INFO TFK CK-S(1)

12

(M,C)

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE ZYUW RUEACMC9058 2722339
R 281402Z SEP 83
FM CMC WASHINGTON DC
TO CG FMFPAC
CG FOURTH FSSG
MARBKS GUANTANAMO BAY CUBA
CG LFTCLANT NORFOLK VA
MCCES TWENTYNINE PALMS CA
AIG EIGHT
INFO CG FMFLANT
XMT CG MCRDERR PARRIS ISLAND SC
HQBN HQMC ARLINGTON VA
FIRST MCD GARDEN CITY LI NY
CG MCRD SAN DIEGO CA
MARBKS WASHINGTON DC
MARFINCEN KANSAS CITY MO

UNCLAS //N0440U//
SUBJ: LITHIUM BATTERIES, BA-5590 (CMC CODE LMA-3)
A. CMC WASHINGTON DC 091403Z JUN 83
B. CMC WASHINGTON DC 011405Z AUG 83
C. CG FMFLANT 271818Z SEP 83 (PASEP)
1. REFS A AND B DIRECTED THE INVENTORY AND REMOVAL FROM SERVICE OF BA-5590 LITHIUM BATTERIES FROM CONTRACTS DAAB07-80-D-6502 (MFR DATES 1080, 1180 AND 1280) AND DAAB07-81-D-6526 (MFR DATES 1181, 0282, 0382 AND 0482). BATTERIES FROM THESE CONTRACT/MFR DATES WERE TO BE DISPOSED OF IF VISUAL DEFECTS WERE PRESENT OR PLACED IN PROTECTED STORAGE IF NO VISUAL DEFECTS WERE NOTED.
2. REF C, TRANSMITTED WITH THE CONCURRENCE OF THIS HQ, AUTH II MAF USE OF BATTERIES PLACED IN PROTECTED STORAGE UNDER CERTAIN CIRCUMSTANCES.
3. AUTH GRANTED FOR MARCOR-WIDE USE OF SUCH BATTERIES (NO VISUAL DEFECTS), SUBJECT TO THE RESTRICTIONS/DIRECTIONS NOTED BY REF C. BT

CMC WASH DC
ACTION L(5)
INFO POC(1) TFK CK(1)

(D,6)

7

MCN=83272/31450 TOR=83272/2314Z TAD=83272/2339Z CDSN=MAB895

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE
R 281403Z SEP 83
FM CMC WASHINGTON DC
INFO CG FMFLANT
CG LFTCLANT NORFOLK VA
MCCES TWENTYNINE PALMS CA
AIG EIGHT
XMT CG MCRD ERR PARRIS ISLAND SC
HQBN HQMC ARLINGTON VA
FIRST MCD GARDEN CITY LI NY

ZYUW RUEACMC1116 2722337

CG FMFPAC
CG FOURTH FSSG
MARBKS GUANTANAMO BAY CUBA

CG MCRD SAN DIEGO CA
MARBKS WASHINGTON DC
MARFINCEN KANSAS CITY MO

P 271818Z SEP 83
FM CG FMFLANT
TO CG SECOND FSSG
CG SECOND MAW
INFO CMC WASHINGTON DC

CG SECOND MARDIV
MSSG TWO FOUR

See CMC 281402Z Sep 83

UNCLAS //N04400//
FR: 21C FOR: SMU/MBH/GA, CSS SUPSPT, DSO, SC-221, SUPO, CEO INFO: LMA-3
SUBJ: LITHIUM BATTIERIES, BA 5590
A. CG SECOND FSSG 211320Z SEP 83
B. CMC WASHINGTON DC 091403Z JUN 83 NOTAL
C. FONECON BTWN MAJ SHIRK (FMFLANT) AND LTCOL LOWE (CMC, LMA-3) OF 26 SEP 83
1. REF A REQ AUTH TO USE SUBJ BATTERIES FR SUSPECT LOTS WHICH ARE BEING HELD IN PROTECTED STORAGE AS PRESCRIBED BY REF B.
2. IAW REF C BATTERIES IN COND CODE E (NO VISIBLE DEFECTS) MAY BE USED WHERE A LITHIUM BATTERY IS CONSIDERED ESSENTIAL. THIS SHOULD NOT INCLUDE ROUTINE TRAINING OR OPERATIONS LHERE NON-LITHIUM BATTERIES ARE A FEASIBLE ALTERNATIVE.
3. BATTERIES MUST BE REINSPECTED BEFORE ISSUE TO ENSURE THAT NO DEFECTS ARE APPARENT. IF DEFECTS ARE PRESENT IN BATTERIES PREVIOUSLY IDENTIFIED AS COND CODE E REVISED COND CODE AND QTY SHOULD BE REPORTED TO CMC (LMA-3) IAW PAR 4.C. OF REF B.
4. WHILE BATTERIES FROM SUSPECT LOTS MAY DISPLAY NO OUTWARD DEFECT THEY MAY HAVE BEEN SUBJECTED TO THE SAME MANUFACTURING DISCREPANCIES AS THOSE WITH VISIBLE DEFECTS. PERSONNEL INSPECTING, HANDLING AND USING THESE BATTERIES SHOULD EXERCISE DUE CARE AND CAUTION AND ADHERE TO PROCEDURES IN REF B. BT

PRIORITY
P 282017Z SEP 83
FM CG FMFLANT
TO CG SECOND FSSG
INFO CMC WASHINGTON DC
CG SECOND MAW

ZYUW RHCJSGG3846 2711545

CG SECOND MARDIV

UNCLAS //N04400//
FR: 21C FOR: CSS SUPSPT SMU/MBH/GA INFO: LMA-3, DSO, WSO
SUBJ: LITHIUM BATTERIES, BA 5590
A. CG FMFLANT 271818Z SEP 83
B. CG SECOND FSSG 132155Z SEP 83 NOTAL
1. REF A AUTH ISSUE OF SUBJ BATTERIES FROM SUSPECT LOTS FOR USE IN OTHER THAN ROUTINE TRAINING AND OPS.
2. TO AMPLIFY REF A, ISSUE OF LITHIUM BATTERIES IS CONSIDERED APPROPRIATE FOR ALL REQUIREMENTS IN PAR 2 OF REF B EXCEPT FOR THOSE EVENTS WHICH WILL TAKE PLACE ENTIRELY IN CONUS. BT

CMC WASH DC
ACTION L(5)
INFO POC(1) TFK CK(1)

(D,6)

7

MCN=83272/31430 TOR=83272/2314Z TAD=83272/2338Z CDSN=MAX998

PRIORITY ZYUW RHCJSGG5679 2501125
P 071358Z SEP 83
FM CG FMFLANT
TO FMFLANT
INFO CMC WASHINGTON DC CG FMFPAC

UNCLAS //N04030//
SECTION 01 OF 02 //N04030//
2D MARDIV/2D MAW/2D FSSG/FMFPAC FOR SC-39/SC-4/CEO; CMC FOR LMA-3 /LFT-1
SUBJ: LITHIUM BATTERIES
A. CMC WASHINGTON DC 281402Z MAR 83
B. COMMANDER NAVSEASYSCOM LTR 04H32/HTH SER 491 8020 DTD 25 MAY 1983 (NOTAL)
C. COMNAVSURFLANT NORFOLK VA 170223Z JUL 83 NOTAL
D. CG FMFLANT 301902Z JUN 83
E. NAVSEAINST 9310.1A
1. PURPOSE. THE PURPOSE OF THIS MSG IS TO PROVIDE A SINGLE DOCUMENT FOR THE HANDLING AND DISPOSAL OF LITHIUM-SULFUR DIOXIDE BATTERIES IAW REFS A THRU E.
2. SAFETY CONSIDERATIONS.
A. GENERAL INFORMATION. THE LITHIUM BATTERY IS A HIGH ENERGY POWER SOURCE THAT CONTAINS LITHIUM METAL, SULFUR DIOXIDE, AND ORGANIC MATERIALS UNDER PRESSURE. THE CONTENTS ARE POTENTIALLY FLAMMABLE, EXPLOSIVE, TOXIC, AND/OR NOXIOUS. THE LITHIUM METAL PRESENT IN THE BATTERY/CELL CAN BURN WHEN EXPOSED TO AIR. BURNING LITHIUM BATTERIES/CELLS CAN CREATE HYDROGEN GAS WHEN IN CONTACT WITH WATER.
SAFETY FEATURES OF THE BATTERY INCLUDE:
(1) THE BATTERY IS PROTECTED BY A SLOW-BLOW REPLACEABLE FUSE. THIS FUSE MUST NOT BE BYPASSED OR REPLACED BY A HIGHER AMPERAGE FUSE BECAUSE OF THE POSSIBILITY OF EXCESSIVE INTERNAL CURRENTS OR SHORT CIRCUITS.
(2) EACH CELL INCORPORATES A VENTING DEVICE WHICH RELEASES PRESSURE IF IT EXCEEDS 350-450 PSI, WHICH IS NORMALLY CAUSED BY OVERHEATING. THE VENT IS DESIGNED TO PREVENT THE CELL FROM RUPTURING. IF VENTING OCCURS, SULFUR DIOXIDE WILL BE RELEASED, AND IRRITATION TO THE EYES AND RESPIRATORY SYSTEM WILL OCCUR LONG BEFORE TOXIC CONCENTRATIONS ARE REACHED.
(3) A THERMAL CURRENT INTERUPTER IS BEING INCORPORATED INTO LITHIUM BATTERIES TO SHUT DOWN BATTERY OPERATION IF THE INTERNAL TEMP EXCEEDS 191 DEGREES F.
B. SAFETY EQUIPMENT.
(1) ALL LITHIUM BATTERY STORAGE AREAS SHALL BE EQUIPPED WITH CLASS D FIRE EXTINGUISHERS. IN THE EVENT THAT A CLASS D EXTINGUISHER IS NOT AVAILABLE FOR ANY REASON, A WATER EXTINGUISHER MAY BE USED; IN SUCH CASES, EFFORT SHOULD BE TO PREVENT THE SPREAD OF THE FIRE TO OTHER COMBUSTIBLES AND NOT DIRECTED ON EXTINGUISHING THE BURNING LITHIUM BATTERIES/CELLS.
(2) AIR RESPIRATORS OR SELF-CONTAINED BREATHING APPARATUS APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH) SHALL BE WORN WHEN ENTERING STORAGE SPACES WHERE LITHIUM BATTERIES ARE VENTING OR HAVE VENTED.
C. THE FOLLOWING PROCEDURES SHOULD BE OBSERVED WHEN LITHIUM BATTERIES ARE USED:
(1) PRIOR TO ANY HANDLING/USAGE, LITHIUM BATTERIES SHOULD BE VISUALLY INSPECTED FOR ANY INDICATION OF DETERIORATION, MOISTURE WITHIN OR INFLATION OF THE PLASTIC WRAP/BAG, OR PUNGENT ODOR.
DO NOT USE THE BATTERY IF ANY OF THESE CONDITIONS EXIST.
(2) BATTERIES ARE TO BE OPENED CAREFULLY IN A WELL VENTILATED AREA AND ARE TO BE HELD AWAY FROM THE FACE WHEN REMOVING THE PLASTIC BAG/WRAP
(3) AFTER BATZRY INSTALLATION INTO THE EQUIPMENT, IF AN OPERATOR DETECTS THE BATTERY COMPARTMENT BECOMING HOT, HEARS CELLS VENTING (HISSING SOUND), OR SMELLS THE IRRITATING PUNGENT GAS SMELL, (SULFUR DIOXIDE GAS) THE FOLLOWING IMMEDIATE ACTIONS WILL BE PERFORMED:
(A) TURN OFF THE EQUIPMENT.
(B) MOVE PERSONNEL OUT OF THE IMMEDIATE AREA.
(C) ALLOW ONE HOUR FOR THE BATTERY TO COOL. IF THE BATTERY IS NOT COOL TO THE TOUCH MORE TIME MAY BE NECESSARY.
(D) WHEN THE BATTERY IS COOL TO THE TOUCH, CAREFULLY REMOVE IT FROM THE EQUIPMENT'(USE OF GLOVES AND PROTECTIVE MASK ARE RECOMMENDED).
(E) PACKAGE THE FAULTY BATTERY IN A PLASTIC BAG (SEALING THE BAG WITH TAPE) AND RETURN TO ORIGINAL FIBERBOARD SHIPPING CONTAINER OR EQUIVALANT PROTECTION. IF THE BATTERY CANNOT BE REMOVED FROM THE EQUIP, PROVIDE LIKE PACKAGING/PROTECTION FOR THE EQUIPMENT.
(F) SEGREGATE THE BATTERY/EQUIP TO PREVENT UNDUE HANDLING OR HAZARD TO PERSONNEL AND REPORT THE INCIDENT/CIRCUMSTANCES AS INDICATED IN FOLLOWING PARA.
D. LITHIUM BATTERY INCIDENT REPORTS. A REPORT WILL BE SUBMITTED TO THE OPERATIONAL COMMANDER WITH INFO COPIES TO CG FMFLANT (CEO), CG FMFPAC (CEO), AND CMC (CODE LMA-3) WHENEVER A LEAKAGE, VENTING, OR RUPTURE OF A LITHIUM BATTERY OR CELL IS DISCOVERED/OCCURS. THE FOLLOWING DETAILS WILL BE PROVIDED AS A MINIMUM:
(1) TYPE OF BATTERY INVOLVED.
(2) MANUFACTURER (MFR) OF BATTERY.
(3) CONTRACT LOT NUMBER.
(4) MFR DATE.
(5) BATTERY SERIAL NUMBER.
(6) WHAT HAPPENED.
(7) PRESENT LOCATION/DISPOSITION OF THE BATTERY.
(8) POINT OF CONTACT FOR ADDITIONAL INFORMATION.
E. CUSTODY OF LITHIUM BATTERIES. POSITIVE PROCEDURES WILL BE ESTABLISHED TO ENSURE THAT THE FOLLOWING TYPES OF EVENTS CANNOT OCCUR (POSSIBLY BY USING A ONE FOR ONE EXCHANGE):
(1) USED LITHIUM BATTERIES BEING REMOVED FROM THE WORKING AREA INTO RESIDENTIAL AREAS.
(2) USED LITHIUM BATTERIES BEING DISCARDED IN THE FIELD.
(3) USED LITHIUM BATTERIES REMAINING IN THE WORKING AREAS INSTEAD OF BEING TURNED INTO SUPPLY FOR DISPOSAL.
3. STORAGE OF LITHIUM BATTERIES. THE FOLLOWING PROVIDES GENERAL GUIDELINES FOR THE STORAGE OF LITHIUM BATTERIES.
A. STORAGE OF NEW LITHIUM BATTERIES IN GARRISON. REF A PROVIDES SPECIFIC DETAILS; HOWEVER, THE FOLLOWING GENERAL GUIDELINES ARE PROVIDED:
(1) LITHIUM BATTERIES SHALL BE STORED IN ORIGINAL SHIPPING CONTAINERS IN A COOL, SPRINKLER PROTECTED, AND VENTILATED SHELTER IF POSSIBLE.
(2) THE STORAGE AREA SHALL BE ISOLATED FROM OTHER HAZARDOUS AND COMBUSTIBLE MATERIAL.
(3) THE STACKS OF LITHIUM BATTERIES SHALL BE LIMITED AMD WILL NOT EXCEED 2,000 SQFT OF STORAGE NOT TO EXCEED 25 FT IN WIDTH OR 16 FT IN HEIGHT. FIRE LANES OF 8 FT BETWEEN STACKS AND A MINIMUM CLEARANCE OF 3 FT FROM ALL WALLS, SPRINKLER SYSTEMS, AND CEILINGS WILL BE ADHERED TO.
(4) STORAGE TEMPERATURES ABOVE 130 DEGREES F SHALL BE AVOIDED.
(5) SPECIAL CARE SHALL BE EXERCISED IN THE HANDLING AND MOVING OF CONTAINERS TO PREVENT POSSIBLE CRUSHING OR PUNCTURING OF BATTERIES.
B. STORAGE OF NEW LITHIUM BATTERIES ABOARD SHIP. REF B PROVIDES THE FOLLOWING GUIDANCE.
(1) STORAGE ON WEATHER DECKS:
(A) LITHIUM BATTERIES SHALL BE STORED IN THEIR ORIGINAL SHIPPING BT

(continued on reverse)

CMC WASH DC
COG L-S(11)
INFO TFK CK-S(1)

12

(M,C)

PRIORITY ZYUW RHCJSGG5680 2501125
P 071358Z SEP 83
FM CG FMFLANT
TO FMFLANT
INFO CMC WASHINGTON DC CG FMFPAC

UNCLAS
FINAL SECTION OF 02 //N04030//
CONTAINERS IN A JETTISONABLE TYPE, DRIP PROOF VENTILATED LOCKER CAPABLE OF MAINTAINING THE STORAGE TEMPERATURE BELOW 130 DEGREES FAHRENHEIT.
(B) THE STORAGE LOCKER SHALL BE ISOLATED FROM OTHER HAZARDOUS AND COMBUSTABLE MATERIEL AND SHALL BE USED ONLY FOR THE STORAGE OF NEW AND UNUSED LITHIUM BATTERIES.
(2) STORAGE BELOW THE DECKS:
(A) LITHIUM BATTERIES SHALL BE STORED IN THEIR ORIGINAL SHIPPING CONTAINERS IN A COOL, SPRINKLER PROTECTED, VENTILATED AREA AND THE STORAGE TEMPERATURE SHALL BE MAINTAINED BELOW 130 DEGREES F.
(B) THE STORAGE AREA SHALL BE ISOLATED FROM OTHER HAZARDOUS AND COMBUSTIBLE MATERIAL AND SHALL BE USED ONLY FOR THE STORAGE OF NEW AND UNUSED LITHIUM BATTERIES. ISOLATION SHALL BE PROVIDED UTILIZING EQUIVALENT BARRIERS TO THOSE USED TO SEPARATE NON-COMPATIBLE STOWS OF L FORM AMMUNITION.
(C) LITHIUM BATTERIES AND LITHIUM POWERED EQUIPMENT WITH BATTERIES INSTALLED SHALL NOT BE STORED IN BERTHING AREAS.
C. STORAGE OF NEW BATTERIES IN A FIELD ENVIRONMENT. THE PROVISIONS OF PARA 3.A ABOVE WILL BE COMPLIED WITH AS MUCH AS POSSIBLE.
D. STORAGE OF USED LITHIUM BATTERIES IN GARRISON. THE PROVISIONS OF PARA 3.A SHALL BE FOLLOWED WITH THE FOLLOWING EXCEPTIONS:
(1) USED/DEPLETED LITHIUM BATTERIES ARE TO BE SEGREGATED FROM NEW LITHIUM BATTERIES.
(2) BATTERIES SHALL BE INDIVIDUALLY SEALED IN A PLASTIC BAG OR WRAPPED IN ELECTRIC INSULATING TAPE, STORED IN A WOODEN BOX OR STRONG FIBERBOARD CONTAINER OF THE SAME OR GREATER CONSTRUCTION AS THE ORIGINAL SHIPPING CONTAINERS (SAVE THE ORIGINAL SHIPPING CONTAINERS FOR THIS PURPOSE).
(3) USED LITHIUM BATTERIES SHALL NOT BE ALLOWED TO ACCUMULATE (NOT MORE THAN 30 DAYS OR 30 LBS) AND SHOULD BE DISPOSED OF PROMPTLY.
E. STORAGE OF USED LITHIUM BATTERIES ABOARD SHIP. REF B STATES "USED OR DEPLETED LITHIUM BATTERIES SHALL ONLY BE STORED ON THE WEATHER DECKS. BELOW DECK STORAGE OF USED OR DEPLETED LITHIUM BATTERIES IS PROHIBITED". THE FOLLOWING GUIDANCE IS ALSO PROVIDED BY REF B:
(1) USED OR DEPLETED LITHIUM BATTERIES SHALL BE STORED IN THEIR ORIGINAL PACKAGING CONTAINERS IN A JETTISONABLE TYPE, DRIP PROOF, VENTILATED LOCKER, CAPABLE OF MAINTAINING THE STORAGE TEMPERATURE.
4. DISPOSAL OF LITHIUM BATTERIES. USED/DEPLETED LITHIUM BATTERIES WILL NOT BE STORED IN EXCESS OF THIRTY DAYS OR EXCEED THIRTY POUNDS WHILE AWAITING DISPOSAL IAW REFS A AND D. THE MEANS OF DISPOSING OF USED/DEPLETED LITHIUM BATTERIES WILL BE DISCUSSED IN THIS PARAGRAPH. IT WILL NOT DISCUSS THE SUPPLY ACCOUNTABILITY OR DOCUMENTATION PROCEDURES, THESE WILL BE IAW STANDARD SUPPLY PROCEDURES.
A. DISPOSAL WITHIN CONUS. USED/DEPLETED LITHIUM BATTERIES MAY BE TURNED INTO THE NEAREST DEFENSE PROPERTY DISPOSAL SFFICE (DPDO) ACTIVITY. THE BATTERIES MUST BE PROPERLY IDENTIFIED, OF BALANCED CELL DESIGN AND CERTIFIED AS SUCH, AND BE PROPERLY PACKAGED. REF D PROVIDED GENERAL GUIDELINES ON THE PACKAGING AND TRANSPORTATION OF LITHIUM BATTERIES.
B. DISPOSAL AT SEA. IAW REF E, USED/DEPLETED LITHIUM BATTERIES MAY BE DISPOSED OF AT SEA PROVIDING THE VESSEL IS OVER 50 MILES FROM SHORE AND THE DEPTH OF THE WATER IS IN EXCESS OF 500 FEET. REF E FURTHER STATES THAT BATTERIES WILL NOT BE STORED ABOARD SHIP FOR DISPOSAL ASHORE.
C. DISPOSAL GUIDELINES OUTSIDE OF CONUS.
(1) DISPOSAL IAW HOST NATION SUPPORT AGREEMENTS IS THE PREFERRED METHOD.
(2) THE NEXT PREFERRED METHOD IS TO TURN THE BATTERIES INTO A DPDO ACTIVITY IF POSSIBLE.
(3) BATTERIES SHOULD BE RETROGRADED TO AMPHIBIOUS SHIPPING FOR DISPOSAL AT SEA IF THE ABOVE LISTED METHODS ARE NOT POSSIBLE.
(4) UNITS BEING DEPLOYED/REDEPLOYED BY MAC AIRLIFT MUST USE AN ALTERNATE POWER SOURCE (E.G. BB 590) IF POSSIBLE, WHEN HOST NATION DISPOSAL, A DPDO ACTIVITY OR AMPHIBIOUS SHIPPING ARE UNAVAILABLE. HOWEVER, IF LITHIUM BATTERIES MUST BE USED THE FOLLOWING METHOD OF DISPOSAL MAY BE REQUIRED ONLY AS A LAST RESORT:
(A) DISPOSAL WILL BE ACCOMPLISHED BY BURNING. A PIT TWO FEET DEEP AND SUFFICIENT TO PLACE A USED AMMO CAN IN WILL BE USED. THE AMMO CAN SHOULD BE FILLED WITH HEAT TABS TO BURN THE BATTERIES.
A SMALL GRILL OVER THE AMMO CAN TO EXPEDITE BURNING IS RECOMMENDED. THIS WILL ALLOW THE FIRE TO HAVE GREATER EFFECT ON THE BATTERIES. ONCE BURNING IS COMPLETE THE BATTERY REMAINS SHOULD BE BURIED IN THE PIT.
(B) SAFETY CONSIDERATIONS. PERSONNEL BURNING THE BATTERIES SHOULD WEAR A PROTECTIVE MASK AND REMAIN UPWIND. BURNING SHOULD TAKE PLACE IN AN ISOLATED AREA AWAY FROM PEOPLE. BT

CMC WASH DC 12
COG L-S(11) (M,C)
INFO TFK CK-S(1)

MCN=83251/05952 TOR=83251/0429Z TAD=83251/0519Z CDSN=MAX994

PRIORITY ZYUW RHCJSGG8763 1811902
P 301902Z JUN 83
FM CG FMFLANT
TO CG SECOND MARDIV CG SECOND MAW
CG SECOND FSSG
INFO CMC WASHINGTON DC CG FMFPAC
HQ MAC SCOTT AFB IL//LNM//

UNCLAS //N04030//
SECTION 01 OF 02 //N04030//
2D MARDIV/2D MAW/2D FSSG/FMFPAC FOR SC-39/SC-4/CEO; CMC FOR LMA-3/LFT-1
SUBJ: LITHIUM BATTERY PACKAGING AND TRANSPORTATION PROCEDURES
A. DOT E 7052
B. HQ AFLC WRIGHT PATTERSON OH 031215Z FEB 83
C. MCO P4030.19D/AFR 71-4
D. CMC WASHINGTON DC 111403Z APR 83
E. COMMANDER, NAVSEASYSCOM 04H32/HTH SER 491 8020 DTD 25 MAY 1982
F. DOTE 8441
G. CFR 49
H. TARIFF NO. 13OE-6000-A
I. HQ AFLC WRIGHT PATTERSON AFB OH 191550Z APR 83
1. PURPOSE. THE PURPOSE OF THIS MSG IS TO PROMULGATE POLICIES FOR THE SAFE PACKING AND TRANSPORTATION OF LITHIUM-SULFUR DIOXIDE BATTERIES IAW REFS A THRU I.
2. INFORMATION. THE LITHIUM-SULFUR DIOXIDE BATTERY REPRESENTS A MAJOR BREAKTHROUGH AS A PRIMARY DIRECT CURRENT SOURCE FOR COMMUNICATIONS AND ELECTRONICS EQUIPMENT. HOWEVER, THERE ARE DANGERS ASSOCIATED WITH CARELESS HANDLING, STORAGE, USE, AND DISPOSAL. THE LITHIUM-SULFUR DIOXIDE BATTERIES CURRENTLY BEING USED IN THE MARINE CORPS AND THE GRAMS OF LITHIUM THEY CONTAIN ARE LISTED BELOW (READ IN FOUR COLUMNS):

BATTERY TYPE	GRAMS LITHIUM PER CELL	CELLS PER BATTERY	TOTAL GRAMS OF LITHIUM
A. BA-5590	2.7-4.0	10	27-40
B. BA-5598	1.7	5	13.5
C. BA-5588	1.8	5	9.0

3. TRANSPORTATION OF LITHIUM BATTERIES. LITHIUM BATTERIES MAY NOT BE TRANSPORTED BY ALL MEANS OF TRANSPORTATION USED BY MARINES. THE MATRIX SHOWN BELOW AND IN SUB PARAGRAPHS ARE INTENDED AS A READY REFERENCE FOR POTENTIAL SHIPPERS:
A. TRANSPORTATION MATRIX FOR LITHIUM BATTERIES (READ IN FIVE COLUMNS).

CARRIER	BAT ONLY	BAT W/PAX	BAT IN EQUIP	USED BAT
COMM AIR	PARA 3.B	NO	NO	NO
MAC AIR	PARA 3.B	PARA 3.C	PARA 3.C	NO
USMC AIR	PARA 3.	PARA 3.D	PARA 3.D	PARA 3.E
COMM SHIP	PARA 3.F	NO	NO	PARA 3.F
AMPHIB SHIP	PARA 3.G	PARA 3.G	PARA 3.G	PARA 3.G
SUBMARINE	NO	NO	NO	NO
OTHER SHIPS	NO	NO	NO	NO
RAIL	PARA 3.F	NO	NO	PARA 3.F
MOTOR VEH	PARA 3.F	NO	NO	PARA 3.F,3.H

B. REF A AUTHORIZES THE TRANSPORTATION OF LITHIUM BATTERIES ABOARD CARGO ACFT ONLY.
(1) BATTERIES CONSTRUCTED OF CELLS CONTAINING NO MORE THAN 12 GRAMS OF LITHIUM (SEE PARA 2) MAY BE SHIPPED IN EITHER A STRONG WOODEN BOX, DOT 12B CONTAINERS (OR EQUIVALENT), DOT 21C FIBER DRUMS (OR EQUIVALENT), OR DOT 17H OR 17C CONTAINERS.
(2) BATTERIES CONSTRUCTED OF CELLS CONTAINING MORE THAN 12 GRAMS OF LITHIUM ARE REQUIRED TO BE TRANSPORTED IN REMOVABLE HEAD CONTAINERS DOT 17H, OR 17C CONTAINERS.
C. REF B GRANTED A WAIVER (AFLC 71-4-83-8) TO SHIP LITHIUM BATTERIES ABOARD PAX CARRYING ACFT PROVIDING THE PROVISIONS OF REF A (SEE PARA 2.A ABOVE) ARE COMPLIED WITH. PROVISIONS OF PARA 3-6 OF REF C (CONTINGENCY OR TACTICAL OPS) MUST BE CITED. IN REMARKS OF SAAM STATE "PROVISIONS OF CHAPTER 3, AFR 71-4/MCO P4030.19D APPLY." MAC PAX ACFT SHOULD BE EXERCISED ONLY WHEN SHIPMENT IN A "CARGO ONLY" CONFIGURATION IS NOT AVAILABLE TO MEET OP REQUIREMENTS.
D. REF D AUTHORIZES TRANSPORTATION OF LITHIUM BATTERIES WITH PAX ABOARD USMC ACFT PROVIDING PROVISIONS OF REF A (SEE PARA 2.A ABOVE) ARE COMPLIED WITH. REF D FURTHER AUTHORIZES AND PROVIDED GUIDELINES FOR TRANSPORTATION OF EQUIPMENT WITH LITHIUM BATTERIES INSTALLED PROVIDING AN ALTERNATIVE POWER SOURCE IS NOT AVAILABLE AND THOSE DEVICES
ARE REQUIRED FOR IMMEDIATE REPEAT IMMEDIATE USE IN THE LANDING ZONE. COMSEC DEVICES WILL NOT HAVE LITHIUM BATTERIES INSTALLED. FOL CHECK LIST WILL BE FOLLOWED WHEN BATTERIES ARE TO BE INSTALLED IN EQUIP:
(1) CHECK EQUIPMENT TO INSURE LITHIUM BATTERIES ARE NOT INSTALLED IN COMSEC EQUIPMENT.
(2) OP-CHECK OF EQUIPMENT WILL OCCUR 45-60 MINUTES PRIOR TO EMBARK (THIS ALLOWS TIME FOR CHEMICAL PROPERTIES OF BATTERIES TO STABILIZE).
(3) TEAM/ACFT COMMANDER WILL PHYSICALLY INSPECT EACH DEVICE CONTAINING LITHIUM BATTERIES TO ENSURE DEVICES ARE TURNED OFF PRIOR TO AND DURING EMBARK OF AIRCRAFT.
(4) DEVICES CONTAINING LITHIUM BATTERIES WILL BE STAGED IN A LOCATION PHYSICALLY SEGREGATED FROM AIRCREW/PAX TO MAX EXTENT POSSIBLE AND ALLOWING JETTISONING OF EQUIPMENT. JETTISON CAPABILITY PRECLUDES AIR SHIPMENT OF COMSEC EQUIPMENT WITH LITHIUM BATTERIES INSTALLED.
E. REF D AUTHORIZES THE TRANSPORTATION (EXTERNAL LIFT ONLY) OF USED LITHIUM BATTERIES VIA HELICOPTER PROVIDING GROUND TRANSPORTATION IS NOT POSSIBLE. FOL GUIDELINES APPLY:
(1) LIFT SHALL BE TO NEAREST POINT SURFACE TRANSPORTATION IS POSSIBLE.
(2) ONLY STRONG OUTSIDE CONTAINERS (PREFERRABLY METAL) WITH VENTING CAPABILITY SHALL BE USED.
(3) ALL PERSONNEL INVOLVED IN AIRLIFT WILL BE BRIEFED (I.E. AIRCREW AND HST PERSONNEL AT DEPARTURE AND RECEPTION LZ) ON NATURE OF MATERIAL AND SPECIAL HANDLING PROCEDURES.
(4) FLIGHT CREW PERSONNEL WILL BE AWARE OF ALL NATOPS PROCEDURES FOR EXTERNAL TRANSPORTATION OF HAZARDOUS CARGO.
F. REF A AUTHORIZES SHIPMENT OF THESE BATTERIES BY COMMERCIAL CARGO VESSELS AND MOTOR VEHICLES, BATTERIES MAY BE SHIPPED IN EITHER A STRONG WOODEN BOX, DOT 12B CONTAINERS (OR EQUIVALENT), DOT 21C FIBER DRUMS (OR EQUIVALENT). OR DOT 17H OR 17C CONTAINERS. REF A DOES NOT AUTHORIZE THE TRANSPORTATION OF LITHIUM BATTERIES DISCHARGED TO LESS THAN 2 VOLTS PER CELL OR BATTERIES CONTAINING ONE OR MORE SUCH CELLS.
G. REF E AUTHORIZES SHIPMENT OF THESE BATTERIES ABOARD AMPHIBIOUS SHIPS. THE PROVISIONS OF REF A APPLY FOR PACKAGING.
(1) NEW/UNUSED BATTERIES MAY BE STORED ON WEATHER DECKS OR BELOW DECKS PROVIDING TEMPERATURES CAN BE MAINTAINED BELOW 130 DEGREES, STORAGE IS VENTILATED, AND ARE ISOLATED FROM OTHER HAZARDOUS CARGO AND COMBUSTABLE MATERIALS.
(A) WEATHER DECK STORAGE CONTAINERS MUST BE JETTISONABLE, DRIP PROOF, AND VENTILATED.
(B) BELOW DECKS STORAGE MUST BE SPRINKLER PROTECTED.
(2) LITHIUM BATTERIES AND EQUIPMENT CONTAINING LITHIUM BATTERIES WILL NOT BE STORED IN BERTHING AREAS.
(3) LITHIUM BATTERIES MAY BE INSTALLED IN EQUIPMENT IN TOPSIDE LOCATBT

(continued on reverse)

CMC WASH DC
COG L-S(11)
INFO TFK CK-S(1)

12

(M,C)

PRIORITY ZYUW RHCJSGG8764 1611902
P 301902Z JUN 83
FM CG FMFLANT
TO CG SECOND MARDIV CG SECOND MAW
CG SECOND FSSG
INFO CMC WASHINGTON DC CG FMFPAC
HQ MAC SCOTT AFB IL//LNM//

UNCLAS
FINAL SECTION OF 02 //N04030//
IONS ONLY. EQUIPMENT CHECKS WILL BE HELD TO A MINIMUM.
(4) USED OR DEPLETED LITHIUM BATTERIES SHALL BE STORED IN THEIR ORIGINAL OR COMPARABLE PACKAGING IN THE JETTISONABLE NONCOMBUSTABLE CONTAINERS.
H. TRANSPORT OF USED BATTERIES IS DISCUSSED IN PARA 3.F ABOVE. HOWEVER, TRANSPORTATION OF LITHIUM BATTERIES FOR DISPOSAL IS GUIDED BY REF F. (REF F IS BEING INCORPORATED INTO REF G; HOWEVER, LABEL WILL READ ORM-C). THE PACKAGING REQUIRED IS DOT CONTAINER 12B FIBERBOARD BOX WITH GROSS WEIGHT NOT TO EXCEED 65 POUNDS.
4. PACKAGING CONTAINERS. ACTUAL PACKAGING SHALL BE IN ACCORDANCE WITH REFS G OR H. THE PURPOSE OF THIS PARAGRAPH IS TO PROVIDE GENERAL INFORMATION ON THESE REFS AND TO POINT OUT PUBLISHED GUIDANCE FR OTHER AUTHORITY.
A. DOT CONTAINER 12B. LITHIUM BATTERIES (BA 5590) ORIGINAL SHIPPING CONTAINER IS AN EXAMPLE OF THIS CONTAINER.
B. DOT CONTAINERS 17C OR 17H. THESE ARE STEEL DRUMS WITH A REMOVABLE LID. THE LID IS SECURED WITH A METAL RING AND A NUT AND BOLT FASTENER.
C. REF I CLARIFIES THAT SHIPMENT OF NEW LITHIUM BATTERIES IN THEIR ORIGINAL OR SUBSTITUTE SHIPPING CONTAINERS MUST MEET DOT CONTAINER 12B SPECS AND MAY BE SHIPPED BY MAC AIR. THIS REF ALSO STATES PACKING OF LOTS OF LITHIUM BATTERIES MAY BE SHIPPED IN AMMO CAN, OVER PACKED WITH STRONG WOODEN BOXES (INSIDE MOUNT-OUT BOXES).
5. LABELS/MARKING. SHIPMENT OF LITHIUM BATTERIES REQUIRES HAZARDOUS CARGO CERTIFICATION AND LABELING OF THE HAZARD.
A. HAZARDOUS CARGO CERTIFICATION (DD FORM 1387-2) WILL BE ATTACHED TO SHIPMENT CONTAINERS BEING AIRLIFTED. IN ADDITION A COPY OF THE FOL REFS WILL BE ATTACHED DEPENDING ON TRANSPORTATION MODE.
(1) MAC AIR-REFS A. B, I
(2) COMM AIR-REF A
(3) USMC AIR-REF D
(4) COMM SHIP-REF A
(5) AMPHIB SHIP-REF E.
(6) RAIL/MOTOR VEHICLE-REF A (DISPOSAL REF A)
(1) NEW OR USED BATTERIES WILL HAVE A SHIPPING LABEL SHOWING FLAMMABLE SOLID.
(2) BATTERIES BEING TRANSPORTED FOR DISPOSAL WILL HAVE A SHIPPING LABEL SHOWING ORM-C.
6. DISPOSAL AND HANDLING OF LITHIUM BATTERIES WILL BE THE SUBJECT OF SEP COR. BT

CMC WASH DC
COG L-S(11)
INFO TFK CK-S(1)

12
(I,M)

MCN=83182/02719 TOR=83182/0214Z TAD=83182/0217Z CDSN=MAC080

PRIORITY
R 041403Z JUN 83 ZYUW RUEACMC4151 1612334
FM CMC WASHINGTON DC
TO CG FMFLANT CG FMFPAC
CG LFTCLANT NORFOLK VA CG FOURTH FSSG
MCCES TWENTYNINE PALMS CA MARBKS GUANTANAMO BAY CUBA
AIG EIGHT
INFO CDRCECOM FT MONMOUTH NJ //DRSEL-MMG-B//
CDRERADCOM FT MONMOUTH NJ //DELET-PB//
CDRERADCOM ADELPHI MD //DRDEL-SS//
XMT CG MCRD PARRIS ISLAND SC CG MCRD SAN DIEGO CA
HQBN HQMC ARLINGTON VA MARBKS WASHINGTON DC
FIRST MARCORDIST GARDEN CITY LI NY
MARFINCEN KANSAS CITY MO

UNCLAS //N04400//
SECTION 01 OF 02
SUBJ: SAFETY OF USE MESSAGE, ADVISORY, TECHNICAL, BATTERY BA-5590, NSN 6135-01-036-3495. CONTRACTS DAAB07-80-D-6502, MALLORY AND DAAB07-81-D-6526, DURACELL (CMC CODE LMA-3)
NOTE: THIS IS A SAFETY ADVISORY MESSAGE THAT HAS NOT, REPEAT HAS NOT BEEN TRANSMITTED TO UNITS SUBORDINATE TO ADDRESSEES. ADDRESSEES SHOULD IMMEDIATELY RETRANSMIT THIS MESSAGE TO ALL SUBORDINATE UNITS, ACTIVITIES OR ELEMENTS AFFECTED OR CONCERNED.
A. CMC WASHINGTON DC 151402Z APR 83
B. CMC WASHINGTON DC 041403Z JUN 83
1. THE REFS ADDRESSED DEFECTS IN BATTERIES MANUFACTURED UNDER THE SUBJECT CONTRACTS. THE BATTERIES WITH DEFECTS MAY BE IDENTIFIED BY VISUAL EXAMINATION AND WILL DISPLAY ONE OR MORE OF THE FOLLOWING CONDITIONS:
A. MOISTURE/DROPLETS WITHIN POLYETHYLENE (PLASTIC) BAG/CASING
B. DISTENSION/BULGING OF THE PLASTIC BAG/CASING
C. DISTENSION/BULGING OF THE BATTERY CASE
D. EVIDENCE OF BATTERY CASE DETERIORATION
NOTE: UNSATISFACTORY OPERATION OFA BATTERY WHICH APPEARS NORMAL DOES NOT IN ITSELF QUALIFY THE BATTERY AS DEFECTIVE. REFER TO PARA 5. BE LOW FOR ADDITIONAL INFO ON REPORTING SUCH BATTERIES.
2. AN INVESTIGATION OF AN INCIDENT AT MCAS CHERRY POINT, NC. HAS DISCLOSED THAT BATTERIES DISPLAYING THE ABOVE DEFECTS ARE POTENTIALLY MORE VOLATILE/HAZARDOUS THAN LITHIUM SULFUR DIOXIDE (LISO2) BATTERIES WHICH APPEAR NORMAL. FURTHER, BATTERIES FROM THE SAME CONTRACT/MANUFACTURE DATE WHICH DO NOT YET OUTWARDLY DISPLAY DEFECT INDICATORS MAY HAVE BEEN SUBJECTED TO THE SAME DISCREPANCIES IN THE MANUFACTURING PROCESS AND MUST ALSO BE SUBJECTED TO EXCEPTIONAL HANDLING.
3. TO MINIMIZE HAZARDS (PRIMARLY TOXIC) PRESENTED BY DEFECTIVE AND POTENTIALLY DEFECTIVE BATTERIES. ALL BA-5590 BATTERIES FROM THE FOLLOWING CONTRACTS AND ASSOCIATED MANUFACTURE DATES (LOTS) SHALL BE IMMEDIATELY REMOVED FROM SERVICE AND EITHER PRESENTED FOR DISPOSAL (DEFECT INDICATORS PRESENT) OR PLACED IN PROTECTED STORAGE (NO DEFECT INDICATORS PRESENT):

CONTRACT	MANUFACTURER	MFR DATES/LOTS
DAAB07-80-D-6502	MALLORY	1080, 1180, AND 1280
DAAB07-81-D-6526	DURACELL	1181, 0282, AND 0382

NOTE: BATTERIES FROM THE ABOVE CONTRACTS HAVING OTHER MFR DATES SHALL REMAIN IN SERVICE UNLESS OTHERWISE DIRECTED BY THIS HQ. HOWEVER, SUCH BATTERIES ARE SUSPECT, ARE TO BE HANDLED WITH CAUTION AND ARE TO BE INSPECTED FREQUENTLY FOR SIGNS OF DETERIORATION/DEFECTS.
4. PROCEDURES.
A. SAFETY. PERSONNEL INSPECTING/HANDLING BATTERIES FROM THE ABOVE NOTED "DEFECTIVE" CONTR/MFR DATES SHOULD WEAR RUBBER GLOVES/APRONS AND NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS.
B. HANDLING. BATTERIES FROM "DEFECTIVE" CONTR/MFR DATES ARE TO BE HANDLED WITH EXTREME CAUTION DURING INSPECTION/PACKING/TRANSPORT. IF THE BATTERIES ARE NEW, DO NOT REMOVE THEM FROM THEIR ORIGINAL PLASTIC BAGS/CASINGS.
C. INVENTORY. A RECORD MUST BE MAINTAINED OF ALL BATTERIES FROM THE "DEFECTIVE" CONTR/MFR DATES WHICH ARE REMOVED FROM SERVICE AND EITHER PRESENTED FOR DISPOSAL OR PLACED IN PROTECTED STORAGE. THE FOLLOWING INFO IS TO BE COLLECTED AND FORWARDED TO THIS HQ (LMA-3) NO LATER THAN 20 JUNE 1983: CONTRACT/MFR DATE/QTY DISPOSED OF OR PLACED IN PROTECTED STORAGE/SER NO(S)/CONDITION (NEW/USED)/DEFECT INDICATOR USE ALPHA CODE A-D FROM PARA 1. PRECEEDING TO IDENTIFY DEFECT INDICATOR: USE "E" FOR BATTERIES APPEARING NORMAL. ADDITIONAL CODES MAY BE UTILIZED FOR OTHER DEFECTS: INCLUDE EXPLANATION OF ADDITIONAL CODE(S).
D. PACKAGING FOR DISPOSAL.
(1) DPDS HAS INDICATED THAT THE FOLLOWING PACKAGING PROCEDURES ARE ACCEPTABLE FOR TURN-IN OF DAMAGED/DEFECTIVE LITHIUM BATTERIES:
(A) PLACE BATTERY IN PLASTIC BAG AND SECURE WITH NON-METALLIC FASTENING (TAPE). THE INTEGRITY OF THE BAG MUST BE MAINTAINED. IF THE BATTERY IS DAMAGED AND MIGHT TEAR THE BAG, PLACE THE BATTERY IN A FIBERBOARD BOX PRIOR TO BAGGING.
(B) PLACE THE BAGGED BATTERY INSIDE FIBERBOARD BOX AND TAPE CLOSED.
(C) BAGGED/BOXED BATTERIES MAY BE OVERPACKED IN FIBERBOARD CONTAINERS. TOTAL CONTAINER WEIGHT MUST NOT EXCEED 65 POUNDS.
(D) OUTSIDE CONTAINER MUST BE MARKED "LITHIUM BATTERIES FOR DISPOSAL" AND "ORM-C".
(2) SECURELY FASTEN AN INVENTORY OF CONTENTS (CONTR/MFR DATE/SER NO(S)/QTY) AND OWNING UNIT IDENT ON OUTSIDE CONTAINER.
(3) ALTHOUGH NOT REQUIRED BY DPDS, IT IS RECOMMENDED THAT BATTERY CONTAINERS BE PLACED WITHIN METAL DRUMS WITH FASTENABLE LIDS OR IN DISPOSAL DRUMS (NSN 8110-01-101-4055) WHILE BATTERIES ARE IN STORAGE PENDING DISPOSAL.
(4) IT IS RECOMMENDED THAT ALL BATTERIES IDENTIFIED FOR PROTECTED STORAGE BE CONSOLIDATED UNDER THE CONTROL OF A SINGLE MANAGER AT EACH
BT

CMC WASH DC 24
ACTION L-S(11) (I,M)
INFO CC-S(10) M-S(1) POC-S(1) TFK CK-S(1)

MCN=83161/28540 TOR=83161/2333

UNCLA

ARLINGTON ANNEX
MESSAGE CENTER
PRIORITY ZYUW RUEACMC4151 1612334
R 041403Z JUN 83
FM CMC WASHINGTON DC
TO CG FMFLANT CG FMFPAC
CG LFTCLANT NORFOLK VA CG FOURTH FSSG
MCCES TWENTYNINE PALMS CA MARBKS GUANTANAMO BAY CUBA
AIG EIGHT
INFO CDRCECOM FT MONMOUTH NJ //DRSEL-MMG-B//
CDRERADCOM FT MONMOUTH NJ //DELET-PB//
CDRERADCOM ADELPHI MD //DRDEL-SS//
XMT CG MCRD PARRIS ISLAND SC CG MCRD SAN DIEGO CA
HQBN HQMC ARLINGTON VA MARBKS WASHINGTON DC
FIRST MARCORDIST GARDEN CITY LI NY
MARFINCEN KANSAS CITY MO

UNCLAS //N04400//
FINAL SECTION OF 02
USMC INSTALLATION AND STORED IN THE SINGLE MOST NEARLY CONFORMING STORAGE FACILITY AT THAT INSTALLATION.
(5) ENSURE THAT BATTERIES ARE STORED/PROTECTED IN A RESTRICTED ACCESS, COOL, WELL VENTILATED LOCATION UNTIL CUSTODY IS PASSED TO SERVING DPDO (DEFECTIVE BATTERIES) OR APPOINTED STORAGE MANAGER (BATTERIES W/O DEFECT INDICATORS).
5. AS INDICATED IN PARA 1. PRECEEDING, SEVERAL USMC UNITS HAVE REPORTED UNSATISFACTORY SERVICE FROM SOME OF THEIR BA-5590 LITHIUM BATTERIES, WITH THE MAJORITY BEING FROM CONTR/MFR DATES ADDRESSED HEREIN AS POTENTIALLY (OR ACTUALLY) DEFECTIVE. UNITS NOTING POOR BATTERY PERFORMANCE SHOULD PROVIDE THE FOLLOWING INFO, VIA THEIR CHAIN-OF-COMMAND, TO THIS HQ (LMA-3): CONTR/MFR DATE/SER NO(S)/QTY/APPLICATION (USE)/LENGTH OF SERVICE.
6. IN ADDITION TO THE REPORTING REQUIREMENTS LEVIED IN PARAGRAPHS 4.C AND 5 PRECEEDING, ADDRESSES ARE TO IMMEDIATELY REPORT ANY LITHIUM BATTERIES FROM OTHER CONTRACTS OR MANUFACTURE DATES (NOT TAKEN FROM SERVICE BY T+1S MESSAGE) WHICH DISPLAY DEFECTS. REPORTS ON SUCH BATTERIES ARE TO CONTAIN DATA REQUESTED IN PARA 4.C ABOVE.
7. THIS HQ WILL COORDINATE WITH THE ITEM MANAGER (CECOM) AND WILL TAKE ALL POSSIBLE ACTION TO GAIN REIMBURSEMENT OR CREDIT FOR AS YET UNUSED BATTERIES DISPOSED OF IAW THIS MESSAGE.
8. HQMC POC IS LTCOL W. N. LOWE, LMA-3, (A) 224-2039. BT

CMC WASH DC 24
ACTION L-S(11) (M,C)
INFO CC-S(10) M-S(1) POC-S(1) TFK CK-S(1)

MCN=83161/28684 TOR=83161/2333Z TAD=83162/0508Z CDSN=MAB158

UNCLASSIFIED

UNCLASSIFIED

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE ZYUW RUEACMC8537 1152257
R 221405Z APR 83
FM CMC WASHINGTON DC
TO CG FMFLANT
CG FMFPAC
CG LFTCLANT NORFOLK VA
CG FOURTH FSSG
MCCES TWENTYNINE PALMS CA
MARBKS GUANTANAMO BAY CUBA
AIG EIGHT
XMT CC MC=D PARFIS ISLAN: SC
XMT CG MCRD SAN DIEGO CA
HQBN HQMC ARLINGTON VA
MARBKS WASHINGTON DC
FIRST MARCORDIST GARDEN CITY LI NY
MARFINCEN KANSAS CITY MO

UNCLAS //N02900//
SUBJ: ACCOUNTABILITY FOR AND PHYSICAL CUSTODY OF LITHIUM SULFUR DIOXIDE (LISO2) BATTERIES (CMC CODE LMA-3)
A. HQ DPDS BATTLE CREEK MI 142019Z APR 83 (NOTAL)
B. CMC WASHINGTON DC 301405Z MAR 83
1. REF A PROVIDED HQ DPDS RESPONSE TO REF B QUERIES ON THE SUBJ OF LISO2 BATTERY DISPOSAL PROCEDURES. THE FOLLOWING PARAGRAPHS PROVIDE INFO EXTRACTED FROM THE DPDS RESPONSE.
2. LITHIUM BATTERY (PICK-UP) CONTRACT. "AWARD IS PROCEEDING ON SCHED-SCHEDULE. AWARD IS EXPECTED THIS MONTH (APR83), WITH CONUS-WIDE PICK UP NO LATER THAN 90 DAYS AFTERWARDS (COMPLETION IN JULY 83)". NOTE: THIS INITIAL CONTRACT IS PRIMARILY FOR PICK-UP OF UNBALANCED CELL LITHIUM BATTERIES; BALANCED CELL BATTERIES AWAITING DISPOSAL WILL ALSO BE COLLECTED.
3. "DPDO'S WILL ACCEPT ACCOUNTABILITY OF LISO2 BATTERIES EVEN IF THEY DON'T HAVE THE FACILITIES TO STORE THEM."
4. "ALL PROPERTY TURNED IN TO THE DPDOS MUST BE IN CONTAINERS THAT ARE NON-LEAKING AND SAFE TO HANDLE. IF THE LISO2 BATTERIES ARE TURNED IN TO THE DPDO IN CONTAINERS WHICH MEET THIS DEFINITION, AND IF THE BATTERIES ARE BALANCED (OF BALANCED CELL DESIGN), THE DPDO WILL TAKE PHYSICAL CUSTODY IF THERE IS CONFORMING STORAGE, OR MOST NEARLY CONFORMING STORAGE. DPDS IS NOW REVIEWING THE PREPARED PACKAGING AND TURN-IN POLICY WHICH YOU SUBMITTED IN THE REFERENCE, AS WELL AS A SIMILAR PROCEDURE SUBMITTED BY USERADCOM (ARMY). FROM THESE TWO, DPDS WILL COORDINATE AMOUNG THE SERVICES AN ACCEPTABLE TURN-IN PROCEDURE FOR DAMAGED/LEAKED LISO2 BATTERIES, INCLUDING PROPER PACKAGING. THIS PROCEDURE WILL BE SENT OUT FOR COORDINATION NLT 2 MAY 83." BT

CMC WASH DC
ACTION L(5)
INFO CC(1) POC(1) TFK CK(1)

8

(D,6)

MCN=83115/19076 TOR=83115/2225Z TAD=83115/2257Z CDSN=MAC047

UNCLASSIFIED

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE ZYUW RUEACMC3541 1011958
R 111403Z APR 83
FM CMC WASHINGTON DC
TO CG FMFLANT
CG FMFPAC
CGMCDEC QUANTICO VA
CG FOURTH MAW
CG FOURTH MARDIV
CG MCLB ALBANY GA
CG LFTCLANT NORFOLK VA
CG FOURTH FSSG
CG MCAGCC TWENTYNINE PALMS CA
CG MCLB BARSTOW CA
MCCES TWENTYNINE PALMS CA
MARBKS GUANTANAMO BAY CUBA
INFO HQ AFLC WPAFB OH//LOZP//
HQ MAC SCOTT AFB IL//TRKC/LNM//
HQ DA WASHINGTON DC//DAPE-HRS//
CDRCECOM FT MONMOUTH NJ //DRSEL-SF-ME//
CDRERADCOM FT MONMOUTH NJ //DELET-PB//
COMNAVSEASYSCOM WASHINGTON DC
CDRERADCOM ADELPHI MD //DRDEL-SS//
NAVMTO NORFOLK VA

UNCLAS //N02900//
SUBJ: AIR TRANSPORTATION OF BA-5590 LITHIUM BATTERIES (CMC CODE LMA-3/ASA-3)
A. CMC WASHINGTON DC 241402Z JAN 83 (NOTAL)
B. HQ AFLC WPAFB OH 031215Z FEB 83 (NOTAL)
C. MCO P4030.19D (AFR 71-4/TM 38-250/NAVSUP PUB 505)
1. THIS MESSAGE PROVIDES AMPLIFYING INFORMATION AND INSTRUCTIONS ON TRANSPORTATION OF LITHIUM BATTERIES VIA MILAIR. REFS A AND B PROVIDE AUTH FOR MILAIR TRANSPORT OF PROPERLY PACKAGED LITHIUM BATTERIES WITH EMBARKED PERSONNEL DURING TACTICAL/CONTINGENCY EXERCISES.
2. THE BA-5590 LITHIUM BATTERY AND ITS "ORIGINAL" PACKAGING MEET DOT-E-7052 SPECIFICATIONS. THE "ORIGINAL" PACKAGING OF THE BA-5590 IS AS FOLLOWS: EA BA-5590 IN PLASTIC CASING INSIDE INDIVIDUAL BOX, TEN BATTERIES/BOXES PER CARTON, 2 CARTONS PER OUTSIDE CONTAINER. EITHER OF THE CONTAINER CONFIGURATIONS (10 OR 20 BATTERY), OR OTHER PACKAGING CONFIGURATION USING CONTAINERS MEETING (AS A MINIMUM) DOT-12B SPECIFICATIONS, MAY BE PRESENTED FOR TRANSPORT VIA MILAIR WITH OR WITHOUT EMBARKED PERSONNEL. IN ANY CONFIGURATION, THE OUTSIDE CONTAINER MUST BE APPROPRIATELY LABELED AND OTHER RESTRICTIONS OF REF C ADHERED TO.
3. IT IS NOT ENVISIONED THAT INDIVIDUAL COMM-ELECT DEVICES TRANSPORTED VIA MAC ACFT WOULD REQUIRE INSTALLATION OF BATTERIES PRIOR TO OR DURING FLT OPS IN LESS THAN ACTUAL (VICE TRNG/EXERCISE) OPERATIONS. ACCORDINGLY, THE REF B WAIVER'S BATTERY PACKAGING RESTRICTION (IAW DOT-E-7052) IS NOT CONSIDERED OVERLY RESTRICTIVE.
4. IN THE CASE OF USMC TACTICAL AIR OPS, HOWEVER, PREPARATION OF COMM-ELECT DEVICES FOR OPERATION PRIOR TO EMBARKATION AND SUBSEQUENT TRANSPORT OF THOSE DEVICES WITH BATTERIES INSTALLED MAY BE REQUIRED. THE FOLLOWING GUIDELINES (AMPLIFYING THOSE OF REF C) ARE PROVIDED FOR THOSE INSTANCES WHERE ALTERNATIVE (NON-LITHIUM) BATTERIES ARE NOT AVAIL (FOR EXAMPLE, BB-590 FOR AN/PRC-104 RADIOS). NOTE: ALTERNATIVE BATTERIES MUST BE MADE AVAIL FOR COMSEC EQUIP (SEE PARA 4.E BELOW).
A. ONLY THOSE DEVICES REQUIRING IMMEDIATE LANDING ZONE UTILIZATION SHALL HAVE LITHIUM BATTERIES INSTALLED.
B. IDEALLY, ONLY NEW LITHIUM BATTERIES SHOULD BE INSTALLED IN EQUIP. HOWEVER, SHOULD THE OPERATIONAL SCENARIO DENY AVAILABILITY OF NEW BATTERIES, THE FRESHEST BATTERIES AVAILABLE MAY BE UTILIZED.
CAUTION: THE RELATIVE SAFETY OF USED (VS NEW) LITHIUM BATTERIES REMAINS UNDETERMINED. ACCORDINGLY, THE INSTALLATION OF USED LITHIUM BATTERIES WILL BE AT THE DISCRETION OF THE LOCAL COMMANDER AND THE AFFECTED AIRCRAFT COMMANDER/LOADMASTER ADVISED OF THE (POTENTIAL) INCREASED HAZARD/RISK.
C. PRIOR TO EMBARK, THE EQUIP WITH LITHIUM BATTERIES INSTALLED MAY BE OP-CHECKED, THEN IMMEDIATELY TURNED OFF. WHEN PRACTICABLE, THE EQUIP SHOULD BE CHECKED 45-60 MINUTES PRIOR TO EMBARK TO ALLOW TIME FOR THE CHEMICAL PROPERTIES OF THE BATTERIES TO STABILIZE.
D. PRIOR TO AND DURING EMBARK, THE TEAM/ACFT COMMANDER WILL PHYSICALLY INSPECT EACH DEVICE WITH LITHIUM BATTERIES INSTALLED TO ENSURE THAT THE DEVICE IS TURNED OFF.
E. TO THE EXTENT ALLOWABLE BY AIRFRAME CONFIGURATION AND THE OPNL SCENARIO, DEVICES WITH LITHIUM BATTERIES INSTALLED WILL BE STAGED WITHIN THE AIRFRAME IN A LOCATION WHICH IS PHYSICALLY SEGREGATED FROM THE AIRCREW/EMBARKED PERSONNEL AND WHICH ALLOWS JETTISONING OF EQUIP IN CASE OF EMERGENCY. THE POSSIBILITY OF HAVING TO JETTISON EQUIP/BATTERIES PRECLUDES INSTAL OF LITHIUM BATTERIES IN COMSEC EQUIP DURING FLT OPS
5. THE PRECEEDING AUTH AND PROCEDURES APPLY ONLY TO AIRLIFT OF NEW/UNUSED LITHIUM BATTERIES IN ORIGINAL OR SUBSTITUTE SHIPPING CONTAINERS, THE AIRLIFT OF EQUIP WITH NEW BATTERIES INSTALLED WHEN REQUIRED BY THE OPERATIONAL SCENARIO, AND THE AIRLIFT OF EQUIP WITH THE FRESHEST USED BATTERIES AVAIL WHEN THE OPERATIONAL SCENARIO DENIES AVAILABILITY OF NEW BATTERIES.
6. ERADCOM HAS INITIATED A STUDY OF USED/DEPLETED LITHIUM BATTERY PROPERTIES/HAZARD LEVELS. UNTIL POSITIVE STUDY RESULTS ARE PROVIDED, THE PRECEEDING AUTH/PROCEDURES DO NOT APPLY TO THE AIRLIFT (INTERNAL LOAD) OF OTHER USED OR DEPLETED LITHIUM BATTERIES IN SITUATIONS SHORT OF ACTUAL (VICE TRNG/EXERCISES) OPERATIONS REQUIRING EMERGENCY AIR TRANSPORT OF SUCH BATTERIES. HOWEVER, IN TRAINING/EXERCISE SITUATIONS WHEREIN ALTERNATIVE POWER SOURCES ARE NOT AVAIL/APPROPRIATE AND RETROGRADE OF USED/DEPLETED LITHIUM BATTERIES IS NOT POSSIBLE VIA SURFACE TRANSPORT, THE BATTERIES MAY BE EXTRACTED IN AN EXTERNAL LIFT CONFIGURATION BENEATH USMC TRANSPORT/UTILITY ROTARY-WINGED ACFT. THE FOLLOWING PROCEDURES WILL BE ADHERED TO:
A. EXTERNAL LIFTS SHALL BE PLANNED TO TERMINATE AT THE NEAREST LANDING ZONE OFFERING ONWARD TRANSPORT OF USED/DEPLETED BATTERIES VIA SURFACE TRANSPORT.
B. BATTERIES MUST BE SECURELY PACKAGED IN STRONG OUTSIDE CONTAINERS, PREFERRABLY METAL, WITH ALL CONTAINERS HAVING A PRESSURE RELEASE/VENTING SYSTEM OR CAPABILITY AND WITH EACH CONTAINER APPROPRIATELY AND CONSPICUOUSLY MARKED.
C. ALL PERSONNEL INVOLVED IN THE LIFT PROCESS, I.E. AIRCREW AND HELO SPT TEAM PERSONNEL AT BOTH DEPARTURE AND RECEPTION LANDING ZONES, MUST BE FULLY BRIEFED ON THE SPECIAL NATURE OF THE CARGO. RECEPTION ZONE PERSONNEL MUST ALSO BE BRIEFED ON SPECIAL HANDLING/STORAGE CONSIDERATIONS.
D. THE FLIGHT CREW WILL INVOKE AND FOLLOW ALL NATOPS PROCEDURES FOR SAFE FLIGHT PERTAINING TO EXTERNAL LIFTS OF HAZARDOUS CARGO.
7. HQMC POC IS LTCOL W. N. LOWE, LMA-3, (A) 224-2039 BT

CMC WASH DC 9
ACTION L(5) (D,6)
INFO A(1) CC(1) POC(1) TFK CK(1)

MCN=83101/13777 TOR=83101/1957Z TAD=83101/1958Z CDSN=MAX046

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE ZYUW RUEACMC3531 1011954
R 111402Z APR 83
FM CMC WASHINGTON DC
TO HQ AFLC WRIGHT-PATTERSON AFB OH//LOZP//
CG FMFLANT
CG FMFPAC
CGMCDEC QUANTICO VA
COMCABEAST CHERRY PT NC
CG FOURTH MAW
CG FOURTH MARDIV
CG MCLB ALBANY GA
COMCABWEST EL TORO CA
CG FOURTH FSSG
CG MCLB BARSTOW CA
INFO CDRCECOM FT MONMOUTH NJ //DRSEL-SF-ME//
CDRERADCOM FT MONMOUTH NJ //DELET-PB//
CDRERADCOM ADELPHI MD //DRDEL-SS//
COMNAVSEASYSCOM WASHINGTON DC

UNCLAS //N04030//
SUBJ: TRANSPORTATION OF LITHIUM BATTERIES ABOARD MAC AIRCRAFT (CMC CODE LMA-3)
A. HQ AFLC WPAFB OH 031215Z FEB 83 (NOTAL)
B. DOT-E-7052 (ELEVENTH REVISION)
C. CG FMFLANT 211500Z MAR 83 (NOTAL)
1. REF A PROVIDED WAIVER AUTHORIZING SHIPMENT OF LITHIUM BATTERIES, PACKED IAW REF B, ABOARD MAC PAX ACFT. REF C SOLICITED ASSISTANCE IN OBTAINING WAIVER AUTHORIZING ALTERNATIVE PACKAGING MATERIALS AND/OR CONTAINERS.
2. OUR INTERPRETATION OF DOCUMENTATION ON THE LITHIUM BATTERY BA-5590 IS THAT THE BATTERY IS MANUFACTURED, TESTED AND PACKAGED TO COMPLY WITH THE PROVISIONS AND MEASURES CONTAINED IN PARA'S 7A/C/D/E/F AND 8E OF REF B. OUR INTERPRETATION HAS BEEN CONFIRMED BY THE CECOM AND ERADCOM BATTERY DEVELOPMENT AND SAFETY OFFICES. ACCORDINGLY, IT IS OUR POSITION THAT BA-5590'S MAY BE SHIPPED VIA MILAIR IN THEIR ORIGINAL CONTAINERS OR SUBSTITUTE CONTAINERS MEETING DOT-12B SPECIFICATIONS. THIS PACKAGING IS SIGNIFICANTLY LESS RESTRICTIVE THAN A REQUIREMENT FOR PACKAGING IAW DOT-17H/C SPECS WHICH WOULD BE INVOKED FOR LITHIUM BATTERIES NOT MEETING THE REF B MANUFACTURING AND TESTING REQUIREMENTS. NOTE: THE PACKAGING OF ODD-LOTS OF NEW LITHIUM BATTERIES IN WOODEN CRATES OR AMMO CANS, AS NOTED IN REF C, WOULD MEET DOT-12B REQUIREMENTS.
3. FOR AFLC. YOUR CONCURRENCE WITH OUR POSITION IS REQUESTED. FURTHER, IT IS REQUESTED THAT A "LITHIUM BATTERIES IN ORIGINAL PACKAGING OR ALTERNATIVE PACKAGING IN STURDY WOODEN/METAL CONTAINERS" AUTHORIZATION BE TRANSMITTED TO MAC PERSONNEL/CARGO TERMINALS TO PRECLUDE POSSIBLE MISINTERPRETATION OF REF B REQUIREMENTS, I.E. DOT-17H/C VICE DOT-12B PACKAGING REQUIRED.
4. FOR USMC ADDEES. THE REF A WAIVER AND PRECEEDING PACKAGING INFO PERTAINS ONLY TO SHIPMENT OF NEW/UNUSED BA-5590 LITHIUM BATTERIES ABOARD MAC AIRCRAFT, EITHER "CARGO ONLY" OR WITH PERSONNEL. AIR SHIPMENT OF USED/DEPLETED LITHIUM BATTERIES IN MILITARY ACFT REMAINS PROHIBITED. FURTHER, THE WAIVER FOR SHIPMENT OF LITHIUM BATTERIES IN MAC PAX ACFT SHOULD BE EXERCISED ONLY WHEN SHIPMENT IN A "CARGO ONLY" CONFIGURATION IS NOT AVAILABLE TO MEET OPERATIONAL REQUIREMENTS.
5. HQMC POC IS LTCOL W. N. LOWE, LMA-3, (A) 224-2039. BT

CMC WASH DC
ACTION L(5)
INFO POC(1) TFK CK(1)

7

(D,6)

MCN=83101/13729 TOR=83101/1954Z TAD=83101/1954Z CDSN=MAB635

ROUTINE ZYUW RUEACMC1123 0942234
P 301405Z MAR 83
FM CMC WASHINGTON DC
TO HQ DPDS BATTLE CREEK MI//DPDS-HEA//
INFO DGSC RICHMOND VA COMNAVFACENGCOM ALEXANDRIA VA
COMNAVSUPSYSCOM WASHINGTON DC HQ DA WASHINGTON DC//DALO-SM//
CDRCECOM FT MONMOUTH NJ //DRSEL-SF-MS/DRSEL-SF-ME//
HQ AFLC WRIGHT-PATTERSON AFB OH//LOLP//
DIR MAT MGT MCCLELLAN AFB CA//MMIR//
COMDT COGUARD WASHINGTON DC
CDRDARCOM ALEXANDRIA VA //DRCRE//
CDRERADCOM ADELPHI MD //DRDEL-SS//
DLA CAMERON STA VA//DLA-SM// CG FMFLANT
CG FMFPAC CG LFTCLANT NORFOLK VA
CG FOURTH FSSG MCCES TWENTYNINE PALMS CA
MARBKS GUANTANAMO BAY CUBA AIG EIGHT
XMT CG MCRD PARRIS ISLAND SC CG MCRD SAN DIEGO CA
HQBN HQMC ARLINGTON VA MARBKS WASHINGTON DC
FIRST MARCORDIST GARDEN CITY LI NY
MARFINCEN KANSAS CITY MO

UNCLAS //N02900//
SUBJ: ACCOUNTABILITY FOR AND PHYSICAL CUSTODY OF LITHIUM SULFUR DIOXIDE (LISO2) BATTERIES (CMC CODE LMA-3/LMM-2)
A. HQ DPDS BATTLE CREEK MI 101349Z FEB 83 (NOTAL)
1. THE REF PROVIDES DPDS POLICY ON THE SUBJ. WE CONCUR IN THE REF'S POLICY REGARDING:
A. REQUIRED BATTERY IDENTIFICATION/CERTIFICATION INFORMATION (BALANCED VS UNBALANCED CELL BATTERIES).
B. PACKAGING OF BATTERIES FOR TURN-IN (SEE PARA 5 BELOW FOR ADDITIONAL INFO).
C. REQUIREMENT FOR DPDO'S TO POSSESS CONFORMING (OR MOST-NEARLY-CONFORMING) STORAGE CAPABILITIES TO ACCEPT PHYSICAL CUSTODY OF LITHIUM BATTERIES.
2. FURTHER, WE CONCUR IN THE REF'S POLICY REGARDING CONTINUED USER RESPONSIBILITY FOR PHYSICAL CUSTODY (ACCOUNTABILITY TO DPDO) OF UNBALANCED CELL LITHIUM BATTERIES. HOWEVER, OUR CONCURRENCE IN THIS ITEM IS PREDICATED UPON THE IMMINENT DPDS ISSUANCE OF A CONTRACT WHICH WILL EFFECT NEAR-TERM PICK-UP OF UNBALANCED CELL BATTERIES FROM CURRENT USMC HOLDERS. IF BATTERIES ARE NOT TO BE PICKED UP BY 30 JUNE 83, OUR COMMENT IN PARA 4 BELOW PERTAINS.
3. WE DO NOT CONCUR IN THE REF'S IMPLIED POLICY REGARDING NON-ACCEPTANCE OF ACCOUNTABILITY IF THE DPDO DOES NOT POSSESS CONFORMING OR MOST-NEARLY-CONFORMING STORAGE CAPABILITIES. NOR DO WE CONCUR IN REF'S STATEMENT THAT, FOR DPDO'S TO ACCEPT ACCOUNTABILITY AND PHYSICAL CUSTODY, "THE BATTERIES MUST BE NON-LEAKING AND SAFE TO HANDLE".
4. IT IS OUR POSITION THAT DPDO'S AND OFF-SITE-BRANCHES SHOULD ACCEPT ACCOUNTABILITY FOR ALL LITHIUM BATTERIES REQUIRING DISPOSAL, REGARDLESS OF BATTERY CONDITION, AND THAT THE RESPONSIBILITY FOR PHYSICAL CUSTODY OF DAMAGED/PHYSICALLY ALTERED LITHIUM BATTERIES SHOULD BE ASSIGNED IN THE SAME MANNER AS THAT FOR "SAFE" LITHIUM BATTERIES, I.E. TO THE AGENCY/OFFICE HAVING CONFORMING OR MOST-NEARLY-CONFORMING STORAGE CAPABILITIES. RATIONALE:
A. THAT CONTROLLED DISPOSAL OF LITHIUM BATTERIES (HAZARDOUS MATERIAL) IS REQUIRED AND MOST EFFICIENTLY PERFORMED VIA DPDS CHANNELS.
B. THAT CONTROLLED STORAGE OF DEPLETED LITHIUM BATTERIES (PENDING DISPOSAL) IS REQUIRED AND THAT, AT ANY GIVEN FACILITY, THE STORAGE LOCATION SHOULD BE THE ONE BEST QUALIFIED UNDER CONFORMING OR MOST NEARLY CONFORMING GUIDELINES.
C. THAT DAMAGED/PHYSICALLY ALTERED LITHIUM BATTERIES, WHEN APPROPRIATELY PACKAGED (SEE PARA 5 BELOW), ALSO REQUIRE DISPOSAL AND QUALIFY FOR TEMPORARY STORAGE (PENDING DISPOSAL) AT THE SELECTED CONFORMING OR MOST-NEARLY-CONFORMING STORAGE SITE.
D. THAT CONFORMING OR MOST-NEARLY-CONFORMING STORAGE SITES MAY, DEPENDING UPON THE FACILITY IN QUESTION, BE UNDER THE CONTROL OF THE TENANT DPDO OR OFF-SITE-BRANCH.
5. PACKAGING LITHIUM BATTERIES FOR TEMPORARY STORAGE, PENDING DISPOSAL:
A. WE ARE ADVISING OUR LITHIUM BATTERY USERS TO REPACKAGE USED/DEPLETED LITHIUM BATTERIES IN THEIR ORIGINAL SHIPPING CONTAINERS (OR SIMILAR, STURDY CONTAINERS) FOR TURN-IN. THE STURDY CONTAINERS WILL PROVIDE MORE BATTERY PROTECTION FOR INCIDENTAL HANDLING AND LOCAL TRANSPORT TO THE STORAGE/DISPOSAL SITE. THE CONTAINERS WILL ALSO FACILITATE ORDERLY STACKING AND INVENTORY CONTROL AT THE STORAGE SITE.
B. AS TO DAMAGED/PHYSICALLY ALTERED LITHIUM BATTERIES, WE BELIEVE THAT THE FOLLOWING PACKAGING AND TEMPORARY STORAGE PROCEDURES WILL ALLOW SAFE HANDLING OF SUCH BATTERIES IN THE DISPOSAL PROCESS:
(1) DAMAGED BATTERIES ARE TO BE ALLOWED TO STABILIZE FOR A MINIMUM OF FOUR HOURS PRIOR TO HANDLING/PACKAGING (BATTERIES MUST BE COOL TO TOUCH).
(2) EACH BATTERY IS TO BE SECURELY SEALED WITHIN A NON-POROUS AND TIGHTLY SEALED PLASTIC BAG TO PREVENT ESCAPE OF OR ACCESS TO BATTERY ELEMENTS/COMPOUNDS. IF THE BATTERY HAS SHARP PROTRUSIONS WHICH MIGHT DESTROY THE PLASTIC SEAL, THE BATTERY SHALL BE PLACED IN A CARTON AND THE CARTON SEALED IN A PLASTIC BAG.
(3) PLASTIC ENCASED BATTERIES ARE TO BE SECURELY PACKAGED WITHIN STURDY CONTAINERS HAVING A VENT CAPABILITY, WITH THE CONTAINERS APPROPRIATELY MARKED AS CONTAINING DAMAGED BATTERIES.
(4) CONTAINERS MAY BE STORED WITH BUT SHOULD BE STACKED SEPARATELY FROM "UNDAMAGED" LITHIUM BATTERIES OR OTHER COMBUSTIBLE MATERIAL, PREFERABLY IN A CONTROLLED, DRY, WELL VENTILATED AREA.
6. REQUEST ADVISE ON ACCEPTABILITY OF OUR POSITION RE: DPDO/OFF-SITE-BRANCH ACCOUNTABILITY FOR ALL LITHIUM BATTERIES REQUIRING DISPOSAL, PHYSICAL CUSTODY RESPONSIBILITY IAW CONTROL OF CONFORMING/MOST NEARLY CONFORMING STORAGE CAPABILITY, AND PACKAGING/STORAGE PROCEDURES FOR DAMAGED/PHYSICALLY ALTERED BATTERIES. FURTHER, REQUEST ADVISE ON PROJECTED CAPABILITY TO EFFECT PICK-UP OF UNBALANCED LITHIUM BATTERIES BY 30 JUNE 83.
7. YOUR EXPEDITIOUS RESPONSE TO THE ABOVE WILL BE APPRECIATED; HQMC POC IS LTCOL W. N. LOWE, LMA-3, (A) 224-2039. BT

CMC WASH DC
ACTION L(5)
INFO CC(1) POC(1) TFK CK(1)

8
(D,6)

MCN=83094/15030 TOR=83094/2225Z TAD=83094/2234Z CDSN=MAB213

ROUTINE ZYUW RUEACMC8713 0880457
R 2814022 MAR 83
FM CMC WASHINGTON DC
TO CG FMFLANT CG FMFPAC
CG LFTCLANT NORFOLK VA CG FOURTH FSSG
MCCES TWENTYNINE PALMS CA MARBKS GUANTANAMO BAY CUBA
AIG EIGHT
XMT CG MCRD PARRIS ISLAND SC CG MCRD SAN DIEGO CA
HQBN HQMC ARLINGTON VA MARBKS WASHINGTON DC
FIRST MARCORDIST GARDEN CITY LI NY
MARFINCEN KANSAS CITY MO

UNCLAS //N04400// SECTION 01 OF 02
SUBJ: LITHIUM BATTERY STORAGE GUIDELINES (CMC CODE LMA-3/LMM-2/LFF-2)
A. HQ DPDS BATTLE CREEK MI 101349Z FEB 83 (NOTAL)
1. GENERAL:
A. LITHIUM BATTERIES, EITHER FRESH OR USED/DEPLETED, ARE NOT TO BE PIERCED, CRUSHED, BURNED, INTENTIONALLY DROPPED, CANNIBALIZED, DISMANTLED, MODIFIED, OR OTHERWISE CARELESSLY HANDLED, NOR SHALL THEY BE SHORT CIRCUITED, CHARGED OR USED IN ANY WAY OTHER THAN THEIR INTENDED USE.
B. ALTHOUGH LITHIUM BATTERIES ARE CLASSIFIED AS FLAMMABLE SOLIDS BY THE DEPT. OF TRANSPORTATION, THE POTENTIAL FOR A FIRE TO START IN THE PACKAGED ITEM IS CONSIDERED THE SAME AS FOR ORDINARY COMBUSTIBLE MATERIALS. HOWEVER, IF INVOLVED IN A FIRE, THE CLASSIFICATION FOR EXTINGUISHMENT PURPOSES WOULD BE "EXTRA HAZARD".
2. STORAGE AREA/FACILITY:
A. REFRIGERATED STORAGE IS NOT REQUIRED.
B. THE STORAGE AREA SHOULD HAVE ADEQUATE VENTILATION TO PREVENT BUILD-UP OF FUMES FROM ANY VENTING/LEAKING BATTERIES AND ALLOW AVOIDANCE OF TEMPERATURES EXCEEDING 130 DEGREES FAHRENHEIT.
C. THE STORAGE AREA SHALL BE IN A FLAMMABLE/HAZARDOUS STOREHOUSE WITH SPRINKLER PROTECTION, IF AVAILABLE. A FLAMMABLE/HAZARDOUS STOREHOUSE WITHOUT SPRINKLERS WILL BE THE SECOND CHOICE. OUTSIDE STORAGE IN A GENERAL STORAGE SHED OR IN VENTILATED LOCKERS IN A LIMITED ACCESS AREA ARE ALSO OPTIONS IF STACKED/STORED BATTERIES WOULD NOT BE SUBJECTED TO TEMPERATURES EXCEEDING 130 DEGREES FAHRENHEIT. ADDITIONALLY, A GENERAL PURPOSE WAREHOUSE MAY BE USED TEMPORARILY IF NONE OF THE PRECEEDING TYPES OF STORAGE FACILITIES ARE AVAIL AT THE TIME STORAGE IS REQUIRED. HOWEVER, OTHER COMBUSTIBLE MATERIAL AND OTHER MORE HAZARDOUS COMMODITIES SHALL NOT BE STORED IN THE SAME FIRE AREA AS THE BATTERIES WHEN THE AREA IS NOT SPRINKLER PROTECTED.
D. SMOKING SHALL BE STRICTLY PROHIBITED AND "NO SMOKING" SIGNS POSTED CONSPICUOUSLY IN BATTERY STORAGE AREAS. THE USE OF OPEN FLAME DEVICES SHALL BE RESTRICTED TO OPERATIONS UNDER PROPER SUPERVISION AND WITH ADEQUATE FIRE PREVENTIVE SAFEGUARDS.
E. ALL LITHIUM BATTERY STORAGE AREAS SHALL BE EQUIPPED WITH A CLASS D" EXTINGUISHER, PREFERRABLY LITH-X-TYPE. IN THE EVENT THAT A CLASS D" IS NOT AVAILABLE FOR ANY REASON, A WATER EXTINGUISHER MAY BE USED; IN SUCH CASES, EFFORT SHOULD BE AIMED AT PREVENTING THE SPREAD OF FIRE TO OTHER COMBUSTIBLES AND NOT DIRECTED ON THE BURNING LITHIUM CELLS.
F. AIR RESPIRATORS OR SELF-CONTAINED BREATHING APPARATUS APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH) SHALL BE WORN WHEN ENTERING STORAGE SPACES WHERE LITHIUM BATTERIES ARE VENTING OR HAVE VENTED.
3. STORAGE/PACKAGING PROCEDURES.
A. IN ANY FACILITY, STACKS OF LITHIUM BATTERIES SHALL BE LIMITED TO 2000 SQ. FT. IN AREA WITH THE WIDTH OF THE STORAGE UNIT NOT MORE THAN 25 FT. AISLES BETWEEN STACKS SHALL BE 8 FT OR ONE-HALF THE STACK HEIGHT, WHICHEVER IS GREATER. A MINIMUM OF 2 FT CLEARANCE SHALL BE MAINTAINED BETWEEN STACKS AND ANY WALL. A 3 FT CLEARANCE SHALL BE MAINTAINED BETWEEN A STACK AND ANY FIRE DOOR OPENING. A VERTICAL CLEARANCE OF 3 FT SHALL BE MAINTAINED BETWEEN THE TOP OF STACKS AND SPRINKLER HEADS OR CEILING/ROOF CONSTRUCTION IN UNSPRINKLERED FACILITIES.
B. NO OTHER MATERIAL OR COMMODITY WILL BE STORED IN THE SAME STACK WITH THE BATTERIES.
C. NEW LITHIUM BATTERIES SHOULD BE STORED IN THEIR ORIGINAL SHIPPING CONTAINERS. IN-SO-FAR AS IS POSSIBLE, UNITS USING LITHIUM BATTERIES SHOULD SAVE THE SHIPPING CONTAINERS FOR REPACKAGING USED/DEPLETED LITHIUM BATTERIES TO FACILITATE TRANSPORT AND/OR TEMP STORAGE PRECEEDING REUSE/DISPOSAL.
D. IF ORGINAL SHIPPING CONTAINERS ARE NOT AVAILABLE, USED AND DEPLETED LITHIUM BATTERIES MAY BE REPACKAGED AND STORED (PENDING FURTHER USE OR DISPOSAL, RESPECTIVELY) IN SIMILAR WOODEN OR STRONG FIBERBOARD BOXES WHICH MEET DOT 12B SPECIFICATIONS. IF METAL CONTAINERS ARE USED, THEY MUST HAVE AN OVER-PRESSURE/VENT CAPABILITY. NOTE: REF A AUTH TURN-IN OF LITHIUM BATTERIES (FOR DISPOSAL) IN PLASTIC BAGS. HOWEVER, BECAUSE SURFACE TRANSPORT IS INVOLVED IN THE TURN-IN PROCESS, PACKAGING THE DEPLETED BATTERIES SECURELY WITHIN STRONG CONTAINERS IS CONSIDERED TO BE A PRUDENT APPROACH.
E. CONTAINERS OF USED OR DEPLETED BATTERIES ARE TO BE APPROPRIATELY AND CONSPICUOUSLY MARKED/LABELED AS PRESCRIBED IN SUBPART "D" AND "E" OF 49CFR. FOR EXAMPLE, DOT "FLAMMABLE SOLID" MARKING AND THE WORDS CONTAINS LITHIUM METAL".
F. CONTAINERS OF USED OR DEPLETED LITHIUM BATTERIES ARE NOT TO BE PLACED IN THE SAME STACKS AS NEW BATTERIES OR OTHER COMBUSTIBLE MATERIAL.
G. DEPLETED LITHIUM BATTERIES ARE NOT TO BE ALLOWED TO ACCUMULATE AT USING UNITS; DISPOSAL SHOULD BE EFFECTED AS PROMPTLY AS POSSIBLE, I.E. A TARGET LIMIT FOR TEMP STORAGE SHOULD BE A MAXIMUM OF 30 POUNDS OR 30 DAYS. A COLLECTION POINT/STORAGE AREA SEPARATE FROM NEW/USED BATTERIES AND OTHER COMBUSTIBLE MATERIAL SHALL BE ESTABLISHED FOR BATTERIES AWAITING DISPOSAL. LITHIUM BATTERIES ARE NOT TO BE DISPOSED OF NOR TRANSPORTED WITH NORMALLY GENERATED REFUSE. BT

CMC WASH DC 23
ACTION L-S(11) (I,M)
INFO CC-S(10) POC-S(1) TFK CK-S(1)

SECTIONAL MESSAGE

UNCL

ARL
MES

ROUTINE ZYUW RUEACMC8714 0880457
R 2814022 MAR 83
FM CMC WASHINGTON DC
TO CG FMFLANT CG FMFPAC
CG LFTCLANT NORFOLK VA CG FOURTH FSSG
MCCES TWENTYNINE PALMS CA MARBKS GUANTANAMO BAY CUBA
AIG EIGHT
XMT CG MCRD PARRIS ISLAND SC CG MCRD SAN DIEGO CA
HQBN HQMC ARLINGTON VA MARBKS WASHINGTON DC
FIRST MARCORDIST GARDEN CITY LI NY
MARFINCEN KANSAS CITY MO

UNCLAS //N04400// FINAL SECTION OF 02
4. HQMC POC IS LTCOL W. N. LOWE, LMA-3, (A) 224-2039. BT

ARLINGTON ANNEX
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ROUTINE ZYUW RUEACMC2977 0710145
R 101402Z MAR 83
FM CMC WASHINGTON DC
TO CG FMFLANT
INFO CG FMFPAC CGMCDEC QUANTICO VA

UNCLAS //N04400//
FOR G4
SUBJ: LITHIUM BATTERY STATUS (CMC CODE LMA-3)
A. CG FMFLANT 091353Z FEB 83
B. CG FMFLANT 281418Z FEB 83
C. CMC WASHINGTON DC 041404Z MAR 83
D. CMC WASHINGTON DC 071402Z MAR 83
E. CMC WASHINGTON DC 151405Z FEB 83
1. REF A PROVIDED A SUMMARY OF LITHIUM BATTERY TRANSPORT, DISPOSAL AND SAFETY/HANDLING CONSIDERATIONS. REF B REQUESTED DELETION OF PORTIONS (PARAS 4.F AND 4.H) OF REF A WHICH DISCUSSED FIRE PROCEDURES AND TEMP STORAGE OF DAMAGED LITHIUM BATTERIES; WE CONCUR IN THE RECOMMENDED CHANGES/DELETIONS.
2. IN ADDITION TO THE ABOVE, ADDEES SHOULD NOTE THE FOLLOWING (REFER TO REF A):
A. PARA 2A(3). WE ARE CURRENTLY STAFFING MORE DEFINITIVE INFO ON TRANSPORTING LITHIUM BATTERIES VIA USMC ACFT.
B. PARA 2B(3). NAVSEA CONCURRANCE FOR TRANSPORTING LITHIUM BATTERIES VIA SUBMARINE WILL BE SOLICITED FOLLOWING RECEIPT OF FMFLANT/PAC INPUT (SEE REF C).
C. PARA 2C(2). DOT-E-8441 HAS BEEN EXTENDED AND RESTRICTIONS/EXEMPTIONS ON TRANSPORTATION OF LITHIUM BATTERIES IN THE DISPOSAL PROCESS REMAIN IN EFFECT.
D. PARA 3.B. REFER TO REFS D AND E FOR LATEST INFO ON DISPOSAL ASHORE. PLEASE NOTE THAT AN UNBALANCED BA-5590 BATTERY WAS RECENTLY SHIPPED BY THE RED RIVER ARMY DEPOT TO A USMC UNIT: CECOM ASSISTANCE HAS BEEN REQUESTED TO PREVENT FURTHER OCCURANCES, BUT MARINE CORPS UNITS SHOULD BE ADVISED TO CHECK ALL INCOMING SHIPMENTS FOR ANY UNDESIRED "UNBALANCED" BATTERIES IDENTIFIED BY REF E.
E. PARAS 3B(1)(B) AND 3B(1)(C). WE HAVE OPENED DISCUSSIONS WITH NAVSEA AND NSWC/WHITE OAK ON THE EFFECTS OF INCINERATING LITHIUM BATTERIES. PENDING RECEIPT OF FAVORABLE DETERMINATIONS ON THE SUBJ, LITHIUM BATTERIES ARE TO BE DISPOSED OF ONLY THROUGH PHYSICAL TRANSFER INTO DPDO CHANNELS (LAND) OR DISPOSAL AT SEA IAW NAVSEAINST 9310.1A (SEE REF A PARA 3A). SEE REF D FOR INST ON REPORTING "UNSAFE" LITHIUM BATTERIES NOT ACCEPTABLE BY DPDO'S; EMERGENCY DESTRUCTION PROCEDURES ARE CURRENTLY UNDER DEVELOPMENT. THE PRECEEDING ALSO APPLIES TO THE PARA 3B(1)(C) COMMENT ON DISPOSAL BY BURYING IN A CONTROLLED HAZARDOUS WASTE LANDFILL.
F. PARA 4G. PENDING MORE SPECIFIC EPA/DPDS GUIDANCE, USMC LITHIUM BATTERIES ARE TO BE REFERRED TO AS "HAZARDOUS MATERIAL" VICE HAZARDOUS WASTE", REGARDLESS OF CONDITION (NEW/USED/DEPLETED/DAMAGED). MCO 4570.24A GERMANE.
G. PARA 4I. ALTHOUGH THE INFO PROVIDED PARALLELS THAT STATED IN THE DRAFT USMC LITHIUM BATTERY SAFETY ORDER, WE CURRENTLY BELIEVE THAT MORE STRINGENT HANDLING INSTRUCTIONS ARE REQUIRED, I.E.:
(1) TURN OFF THE EQUIPMENT AND MOVE PERSONNEL OUT OF THE IMMEDIATE AREA.
(2) ALLOW ONE HOUR FOR THE BATTERY TO COOL. IF THE BATTERY IS NOT COOL TO THE TOUCH MORE TIME MAY BE NECESSARY BEFORE REMOVING THE BATTERY FROM THE EQUIP.
(3) WHEN BATTERY IS COOL TO TOUCH, CAREFULLY REMOVE IT FROM THE EQUIP (USE OF GLOVES OR OTHER PROTECTION RECOMMENDED). PACKAGE THE FAULTY BATTERY IN AN INDIVIDUAL NON-POROUS CONTAINER/BAG AND OVERPACK THE CONTAINER TO PREVENT (FURTHER) PHYSICAL DAMAGE/MISHANDLING.
(4) IT THE BATTERY CANNOT BE REMOVED FROM THE EQUIP, PROVIDE LIKE PACKAGING/PROTECTION FOR THE EQUIP.
(5) SERREGATE THE BATTERY/EQUIP TO PREVENT UNDUE HANDLING OR HAZARD TO PERSONNEL AND REPORT THE INCIDENT/CIRCUMSTANCES IAW REF D.
3. PLEASE ENSURE THAT PRECEEDING INFO IS PROVIDED TO ALL RECIPIENTS OF REF A AND SUBSEQUENT READDRESSALS OF SAME. FURTHER REQUEST THAT INFO PERTINENT TO SUBORDINATE COMMANDS BE EXTRACTED FROM PARA 2 PROCEEDING AND TRANSMITTED TO THOSE COMMANDS FOR ACTION/INFO.
4. HQMC POC IS LTCOL W. N. LOWE, LMA-3, (A) 224-2039. BT

CMC WASH DC 10
ACTION L(7) (D,6)
INFO CC(1) POC(1) TFK CK(1)

MCN=83071/02080 TOR=83071/0145Z TAD=83071/0149Z CDSN=MAB508

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE ZYUW RUEACMC0943 0680508
R 071402Z MAR 83
FM CMC WASHINGTON DC
TO CG FMFLANT CGMCDEC QUANTICO VA
CG FMFPAC CG FOURTH MAW
CG FOURTH MARDIV CG MCLB ALBANY GA
CG MCAGCC TWENTYNINE PALMS CA CG MCLB BARSTOW CA
CG LFTCLANT NORFOLK VA CG FOURTH FSSG
MCCES TWENTYNINE PALMS CA MARKBS GUANTANAMO BAY CUBA
INFO CDRCECOM FT MONMOUTH NJ //DRSEL-SF-ME//
DPDS BATTLE CREEK MI //DPDS-HEA//
SCIAD FMFPAC CAMP PENDLETON CA

UNCLAS //N04400//
FOR : G4, SUPO, CEO
SUBJ: DISPOSAL OF LITHIUM BATTERIES (CMC CODE LMA-3)
A. HQ DPDS BATTLE CREEK MI 101349Z FEB 83 (PASEP)
B. HQ DPDS BATTLE CREEK MI 241300Z JAN 83 (NOTAL)
C. CMC WASHINGTON DC 151405Z FEB 83 (PASEP)
D. CG FMFLANT 091353Z FEB 83 (NOTAL)
1. REF A, WHICH SUPERCEDES REF B, PROVIDES FOR THE TURN-IN OF LITHIUM BATTERIES TO DPDO'S IN THE LITHIUM BATTERY DISPOSAL PROCESS. CONDITIONS WHICH MUST BE MET FOR THE SERVING DPDO, INCL OFF-SITE BRANCHES (OSB), TO TAKE PHYSICAL CUSTODY ARE:
A. BATTERIES MUST BE PROPERLY IDENTIFIED, BE OF BALANCED CELL DESIGN AND CERTIFIED AS SUCH, AND BE PROPERLY PACKAGED.
B. BATTERIES MUST BE SAFE TO HANDLE.
C. DPDO/OSB MUST HAVE "CONFORMING" STORAGE.
2. REF C PROVIDED INST ON TURN-IN OF "UNBALANCED" CELL LITHIUM BATTERIES. FURTHER, NO DIFFICULTIES SHOULD BE ENCOUNTERED IN PROVIDING THE REQUESTED BATTERY IDENTIFICATION/CERTIFICATION INFO OR PACKAGING FOR TURN-IN.
3. PENDING DEVELOPMENT/DISTRIB OF EMERGENCY DESTRUCTION PROCEDURES, TAKE ALL AVAILABLE STEPS TO SAFEGUARD PERSONNEL/EQUIP/FACILITIES FROM LITHIUM BATTERIES CONSIDERED UNSAFE (DAMAGED, LEAKING, ETC) AND NOT ACCEPTABLE FOR TURN-IN AND DISPOSAL VIA ROUTINE CHANNELS. REPORT THE CIRCUMSTANCES BY IMMED MSG TO THIS HQ (LMA-3); DISPOSITION INST WILL BE PROVIDED.
4. AVAILABILITY/POSSESSION OF CONFORMING AND/OR MOST NEARLY CONFORMING STORAGE FACILITIES, AND A CHECKLIST FOR DETERMINING SAME, WILL BE FORMALLY ADDRESSED BY A FORTHCOMING MCBUL OF THE 6280 SERIES. ACTIVITY COMMANDERS, WHO ARE RESPONSIBLE FOR HAZARDOUS MATERIAL MANAGEMENT, AND THE TENANT DPDO/DSB WILL UTILIZE THE CHECKLIST TO DETERMINE THE AVAILABILITY OF CONFORMING AND/OR MOST NEARLY CONFORMING STORAGE CAPABILITIES. THE FINAL DETERMINATION ON RESPONSIBILITY FOR STORAGE OF HAZARDOUS MATERIAL FOR DISPOSAL (I.E. DEPLETED LITHIUM BATTERIES) WILL BE MADE BY THE HOST FACILITY/ACTIVITY COMMANDER.
5. AS NOTED WITHIN REF C, HQ DPDS IS DEVELOPING A CONTRACT FOR NEAR-TERM PICK-UP/DISPOSAL OF BOTH BALANCED AND UNBALANCED CELL LITHIUM BATTERIES. DPDS WILL ALSO BE LETTING SUBSEQUENT CONTRACTS FOR CONTINUING/FUTURE LITHIUM BATTERY PICK-UP AND DISPOSAL. TO ASSIST IN THE DEVELOPMENT OF THIS/THESE FOLLOW-ON CONTRACT(S), PLEASE PROVIDE THE FOLLOWING INFORMATION TO THIS HQ (ATTN:LMA-3) BY 1 APRIL 83.
A. GEOGRAPHIC LOCATION/NAME OF ACTIVITY AND SERVING DPDO/OSB TO HAVE PHYSICAL CUSTODY OF AND/OR ACCOUNTABILITY FOR LITHIUM BATTERIES REQUIRING DISPOSAL.
B. BATTERY NOMENCLATURE AND NSN
C. ESTIMATED QTY PER MONTH OR OTHER SPECIFIED TIME PERIOD.
6. THE PRECEEDING DATA WILL BE CONSOLIDATED AND FORWARDED TO HQ DPDS BY THIS HQ. ENSURE THAT AFFECTED DPDO/OSB IS MADE AWARE OF PLANNING DATA PROVIDED.
7. REF D PROVIDED RESUME OF LITHIUM BATTERY USE/STORAGE/TRANSPORTATION/DISPOSAL PROBLEMS. WE SHARE FMF CONCERN AND CONTINUE IN OUR EFFORTS TO NEGATE OR ALLEVIATE THOSE PROBLEMS. SOLUTIONS TO INDIVIDUAL PROBLEMS WILL BE PROVIDED BY MESSAGE TO ALLOW IMMEDIATE APPLICATION; A SINGLE CMC DIRECTIVE WILL BE PUBLISHED IN THE NEAR FUTURE FOLLOWING RESOLUTION OF MAJOR PROBLEM AREAS.
8. HQMC POC IS LTCOL W. N. LOWE, LMA-3, (A)224-2039 BT

CMC WASH DC 5
ACTION L(4) (D,6)
INFO TFK CK(1)

MCN=83068/06315 TOR=83068/0458Z TAD=83068/0531Z CDSN=MAB649

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE ZYUW RUEACMC9896 0690414
R 081405Z MAR 83
FM CMC WASHINGTON DC
INFO CG FMFLANT CG FMFPAC
CGMCDEC QUANTICO VA CG FOURTH MAW
CG FOURTH MARDIV CG MCLB ALBANY GA
CG LFTCLANT NORFOLK VA CG FOURTH FSSG
CG MCAGCC TWENTYNINE PALMS CA CG MCLB BARSTOW CA
MCCES TWENTYNINE PALMS CA ZEN/MARBKS GUANTANAMO BAY CUBA
P 101349Z FEB 83
FM HQ DPDS BATTLE CREEK MI
TO CDR DPDR EUR LINDSEY AS GER//DPDR-ER//
DPDR MEMPHIS TN//DPDR-MR//
CDR DPDR PAC CAMP H M SMITH HI//DPDR-PR//
DPDR COLUMBUS OH//DPDR-CR// DPDR OGDEN UT//DPDR-OR//
INFO DGSC RICHMOND VA//DGSC D//
NAVFACENGCOM WASH DC//CODE 1121A//
NAVSUPSYSCOM WASH DC//NAVSUP 04226//
HQ DA WASH DC//DALO-SM//
CDR CECOM FT MONMOUTH NJ//DRSEL SF MS//
HQ AFLC WP AFB OH//LOLP//
DIR MAT MGT MCCLELLAN AFB CA//MMIR//
CMC WASH DC//LMA 3// COMDT CO GARD WASH DC
CDR DARCOM ALEXANDRIA VA//DRCRE//
CDR ERADCOM ADELPHI MD//DRDEL SS//
DLA CAMERON STA VA//DLA SM//

UNCLAS DPDS-HEA 0912. SUBJECT: PHYSICAL CUSTODY OF LITHIUM SULFUR DIOXIDE(LISO2) BATTERIES.
REFERENCE; DPDS-HEA MSG 241300Z JAN 83, SUBJECT AS ABOVE.
1. REFERENCE IS RESCINDED. THE FOLLOWING SUBJECT POLICY CHANGE REPLACES IT AND TAKES EFFECT UPON RECEIPT.
A. DPDO S WILL TAKE ACCOUNTABILITY AND PHYSICAL CUSTODY OF LITHIUM BATTERIES UNDER THE FOLLOWING CIRCUMSTANCES;
1. THOSE LITHIUM BATTERIES PROCURED BY THE ARMY FROM 1980 ON, WITH THE EXCEPTION OF ANY LITHIUM BATTERIES PROCURED UNDER CONTRACTS #DAAB07-78-D-6353, AND #DAAB-07-77-C-0464. (ACCOUNTABILITY BUT NOT PHYSICAL CUSTODY SHOULD BE TAKEN FOR THESE BATTERIES.) SPECIAL ATTENTION SHOULD BE GIVEN TO BATTERIES PROCURED UNDER CONTRACT #DAAB07-80-D-6504. BOTH UNBALANCED AND BALANCED CELL BATTERIES WERE PROCURED FROM THIS CONTRACT. (UNBALANCED BATTERIES ARE SUBJECT TO EXCESSIVE PRESSURE BUILDUP AND RUPTURE OF BATTERY CASING.) ANY BATTERIES PROCURED UNDER THIS LATTER CONTRACT WITH A MANUFACTURE DATE OF OCT 81(10/81) OR LATER, AND THAT HAVE AN "A" FOLLOWING THE SERIAL NUMBER ARE OF BALANCED CELL DESIGN. ACCOUNTABILITY AND PHYSICAL CUSTODY CAN BE TAKEN FOR THESE BATTERIES. HOWEVER, ACCOUNTABILITY BUT NOT PHYSICAL CUSTODY SHOULD BE TAKEN FOR BATTERIES MANUFACTURED UNDER THIS CONTRACT PRIOR TO OCT 81.
(2) THE BATTERIES FOR TURN IN ARE PROPERLY IDENTIFIED, TO INCLUDE A CERTIFICATION ON THE TURN-IN DOCUMENT BY THE TURN-IN ACTIVITY THAT THE BATTERIES ARE "BALANCED CELL BATTERIES".
(3) THE BATTERIES MUST BE NON-LEAKING AND SAFE TO HANDLE, IN THE ORIGINAL CONTAINER OF UNUSED ,OR IN FIBERBOARD BOXES OR PLASTIC BAGS IF USED.
(4) THE DPDO POSSESSES CONFORMING STORAGE AS DETERMINED BY USE OF THE CONFORMING STORAGE CHECKLIST.
(B) TO SUMMARIZE, UNDER NO CIRCUMSTANCES WILL THE DPDO TAKE PHYSICAL CUSTODY OF "UNBALANCED" BATTERIES, NSN 6135-01-036-3495, MANUFACTURED UNDER CONTRACTS #DAAB-07-77-C-0464 '(MALLORY) AND #DAAB07-78-D-6353 (POWER CONVERSION, INC.). NEITHER WILL DPDO S TAKE PHYSICAL CUSTODY OF "UNBALANCED" BATTERIES MANUFACTURED PRIOR TO OCT 81 UNDER CONTRACT # DAAB07-80-D-6504 (POWER CONVERSION, INC.). MANUFACTURE DATE AND CONTRACT NUMBER CAN BE USUALLY VERIFIED BY CHECKING THE MARKING ON THE BATTERIES(USED).
2. REQUEST THIS POLICY CHANGE BE DISSEMINATED TO DPDO S IMMEDIATELY. THIS POLICY CHANGE IS ADDRESSED IN THE BATTERY CHAPTER TO DPDS-M 6050.1, PRESENTLY IN PUBLICATION. BT

CMC WASH DC 7
ACTION L(5) (D,6)
INFO POC(1) TFK CK(1)

MCN=83069/05338 TOR=83069/0414Z TAD=83069/0415Z CDSN=MAC744

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* UNCLASSIFIED *
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SUBJECT: HAZARDOUS CARGO WAIVER FOR LITHIUM BATTEREIS ABOARD PAX ACFT.
REF: YOUR MSG 311852Z JAN 83
1. CLEARANCE IS GRANTED TO SHIP LITHIUM BATTERIES PREPARED FOR SHIPMENT ACCORDING TO DOT-E-7052 BY MILITARY AIRCRAFT. ALL OTHER REQUIREMENTS OF AFR 71-4 APPLY.
2. AFR 71-4/MCO P4030.19 PARAGRAPH 3-6 IS APPLICABLE FOR TACTICAL OR CONTINGENCY EXERCISES.
3. WAIVER NUMBER AFLC 71-4-83-8 APPLIES TO THESE SHIPMENTS. ANY INCIDENT MUST BE REPORTED TO THIS OFFICE AS SOON AS POSSIBLE. THIS WAIVER EXPIRES 29 FEB 1984. BT

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DEPARTMENT OF THE NAVY

NAVAL SEA SYSTEMS COMMAND

WASHINGTON, D.C. 20362

IN REPLY REFER TO
04H32/HTH
Ser 491
8020

25 MAY 1982

From: Commander, Naval Sea Systems Command
To: Commandant of the Marine Corps (LMA-4)

Subj: Replacement Lithium Batteries for Marine Corps electronic equipment; Shipboard storage and handling aboard Amphibious type Surface Ships

Ref: (a) Headquarters USMC ltr LMA-4/REO-reo of 1 Feb 1982
(b) NAVSEASYSCOM ltr 04H132/HTH Ser 439 8020 of 6 Jul 1981

1. Reference (a) requested consideration be given to revising the guidance for shipboard storage and handling of replacement type lithium batteries as stated in reference (b). Reference (a) indicates that the guidance of paragraph 5.b. prohibiting the return aboard ship of used lithium batteries or lithium battery powered equipment with batteries installed, is unduly restrictive in view of the cost of the batteries and it creates a disposal problem ashore. In consideration of these facts the guidance presented by reference (b) has been revised.

2. The revised guidance is based on the following rationale: While cost is a factor in assessing the safety of an item, the prime factor in the decisions reached regarding The Marine Corps intended use of replacement type lithium batteries is that the hazard associated with lithium batteries increases after use. All known incidents involving venting of lithium sulfur dioxide batteries have occurred with batteries either in use, storage after use, or during repeated use. In considering shipboard storage of large quantities of replacement batteries precautions must be taken to protect against the effects of a venting occurring in a mass storage area. The optimum protection, from a shipboard safety point of view, is afforded by not allowing used batteries back aboard the ship. As noted in reference (a), this presents a problem in disposal at the site of use as well as a considerable operations cost. Therefore, the revised guidance presented below reflects a change in policy to allow once used lithium batteries and equipment containing such batteries back aboard ship for storage in jettisonable topside lockers for shipment back for either disposal or future employment. It is to be noted that accident data indicates that the hazard to personnel is greater when used lithium batteries are utilized. The following revised guidelines will replace those of reference (b).

3. New and unused lithium batteries may be stored on amphibious type surface ships either on the weather decks or below decks. In either storage location the quantity stored in an area shall be kept to the minimum consistent with requirements since the effect of mass storage on the hazard degree is not known. Weather deck storage is preferred and is to be utilized if at all possible. Specifically then for:

(a) Storage on the weather deck

(1) Lithium batteries shall be stored in their original shipping containers in a jettisonable type, drip proof, ventilated locker capable of maintaining the storage temperature below 130°F.

(2) The storage locker shall be isolated from other hazardous and combustible material and shall be used only for the storage of new and unused lithium batteries.

(b) Storage below the decks

(1) Lithium batteries shall be stored in their original shipping containers in a cool, sprinkler protected, ventilated area and the storage temperature shall be maintained below 130°F.

(2) The storage area shall be isolated from other hazardous and combustible material and shall be used only for the storage of new and unused lithium batteries. Isolation shall be provided utilizing equivalent barriers to those used to separate non-compatible stows of L form ammunition.

(3) Lithium batteries and lithium powered equipment with batteries installed shall not be stored in berthing areas.

4. Used or depleted lithium batteries shall only be stored on the weather decks. Below deck storage of used or depleted lithium batteries is prohibited. Specifically then for:

(a) Storage on the weather deck

(1) Used or depleted lithium batteries shall be stored in their original packaging containers in a jettisonable type, drip proof, ventilated locker, capable of maintaining the storage temperature below 130°F.

(2) The jettisonable locker shall be isolated from other hazardous items and combustible material and shall be used only for the storage of used or depleted lithium batteries or equipment with used lithium batteries installed.

5. Due to the increased hazard associated with use, handling and storage of depleted or used lithium batteries, the following shall apply:

a. Preparatory to the ashore employment of equipment using lithium batteries, the batteries may be mated to the equipment aboard ship in topside locations only. Shipboard equipment checks shall be held to a minimum and be performed in topside locations only.

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Ser 491
8020

b. Upon completion of each ashore employment all used or depleted lithium batteries or equipment with lithium batteries installed, shall be stowed in jettisonable topside lockers.

c. All used or depleted lithium batteries shall be off-loaded at the earliest possible time, however, in no case shall they be off-loaded during ammunition or fueling evolutions.

6. It is requested that specific details be furnished this Command identifying specific ships, quantities of batteries for each and storage volume required. This information will be used in developing SHIPALTS to accommodate such storage.

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M. R. VAN SLYKE
By direction

DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
WASHINGTON, D C. 20362

IN REPLY REFER TO
NAVSEAINST 9310.1A
SEA 04H32/HTH
Ser 88
11 March 1982

NAVSEA INSTRUCTION 9310.1A

From: Commander, Naval Sea Systems Command
To: All Offices Reporting Directly to COMNAVSEA
Distribution List

Subj: Naval Lithium Battery Safety Program; responsibilities and procedures for

Ref: (a) NAVMATINST 5100.6A of 28 Feb 1980, subj: System Safety Program: implementation of
(b) MIL-STD-882A of 28 Jun 1977
(c) NAVMATINST 4030.11 of 2 Nov 1979, subj: Hazardous Material Packaging Certification; policies and procedures for

Encl: (1) Use, Packing, Storage, Transporting and Disposal of Lithium Batteries
(2) Safety and Performance Tests for Qualification of Lithium Batteries

1. Purpose. To establish and promulgate policy, responsibilities and guidelines for the design, acquisition, testing, evaluation, use, packaging, transportation, storage and disposal of lithium batteries and equipment powered by such batteries.

2. Cancellation. NAVSEAINST 9310.1 of 30 Mar 1979 is hereby cancelled and superseded.

3. Scope. This instruction is applicable to all Navy activities and to Marine Corps activities to the extent specified by the Commandant. Material to which this instruction applies includes lithium batteries and all equipment powered by lithium electrochemical power source(s) through all phases of the life cycle of such systems.

4. Background

a. The stringent performance requirements of present and future Naval battery powered systems necessitate the use of advanced lithium batteries with extended energy and life characteristics. In recent years, battery manufacturers in the United States and various foreign nations have been developing new lithium batteries using lithium metal anodes coupled with either carbon monofluoride (CF), sulfur dioxide (SO_2), thionyl chloride ($SOCl_2$) or other cathode materials. These batteries represent a major breakthrough as primary power sources and provide certain unique advantages over conventional electrochemical systems. The advantages are: (1) a substantial improvement in specific energy, (2) higher operating cell voltage, (3) low temperature operation and (4) projected long shelf life. While lithium batteries in general offer five to ten times the specific energy of conventional systems, each design differs from the other in its level of performance, range and scope and in their hazard

S-066

b. Lithium batteries should be considered hazardous at all times, especially under conditions of abuse, misuse, depletion or partial discharge. Incidents have been documented involving the venting of toxic gases, fires and explosions.

c. Knowledge of the chemistry of lithium batteries under all possible Fleet conditions is the key to the identification and control of related safety and environmental hazards, and is essential if efforts to overcome these hazards by battery design or by logistics management and control are to succeed. The highly energetic and reactive nature of lithium batteries requires that safeguards be employed in their design, fabrication, procurement, packaging, handling, transportation, use, storage and disposal. In general, manufacturers are aware that under certain conditions lithium batteries may be unsafe and most manufacturers have incorporated safety devices such as: (1) pressure relief mechanisms, (2) fuses to protect against overload and (3) diodes to prevent cell reversal or charging. The reliability of these safety devices in many cases is dependent on the environment in which the battery is used, as well as the mode of operation.

5. Policy

a. It is the policy of the Chief of Naval Material and the Commander, Naval Sea Systems Command that full consideration and timely attention will be given to matters concerned with lithium battery safety. All lithium batteries and every system (end item) using a lithium battery must be reviewed, tested and approved in accordance with enclosures (1) and (2) before the system shall be permitted to advance to the next stage of development and before test, prototype or production units are introduced to the Fleet. The Naval Surface Weapons Center (NAVSWC), under the direction of SEA 04H, will act as lead laboratory in performing this function.

b. Due to the hazard potential in use and the ecological aspects of disposal, lithium batteries may be used only when it is established that no other battery will provide adequate performance to meet an operational requirement. Only lithium batteries which have been approved for a specific application shall be procured for fleet use and then solely for that application. The Systems Command having cognizance of the development or acquisition is responsible for issuing such approval for service use. A technical safety evaluation of the battery and its intended use shall be the basis for the approval decision.

6. Responsibilities

a. The Commander, Naval Sea Systems Command (SEA 04H): as the designated technical authority for lithium battery safety within the Naval Material Command, per CHNAVMAT ltr 04F4/HAM of 12 September 1977, will direct and coordinate efforts of all technical offices in regard to lithium battery safety, provide technical guidance and act authoritatively for the Naval Material Command in such matters; and serve as a single point of contact for lithium battery safety and technical matters relating thereto within the Department of the Navy. Specific questions related to the design, use, packaging, storage, transportation and disposal of these batteries are to be addressed to the Commander, Naval Sea Systems Command (SEA 04H), Washington, D.C. 20362.

b. Each program manager, designer, producer, processor, packager, handler or user of lithium batteries is responsible for safety within his realm of activity.

c. All Systems Commanders, Project Managers and Research and Development Activities under the command of the Chief of Naval Material are responsible for implementing the Lithium Battery Safety Program within their cognizant material support area. Specifically:

(1) Assure that lithium battery safety criteria are incorporated in the design of lithium batteries and all lithium powered equipment under their cognizance.

(2) A systems safety approach as prescribed in references (a) and (b) to ensure the safety of the lithium battery in the end item of use and its interface with launch platforms (i.e., aircraft/ships) shall begin with the inception of a program (e.g. operational requirement (OR), development proposal (DP), Navy Development Concept Paper (NDCP) of a system, or the modification of an existing system). NDCPs and other development or contractual documents shall reflect a formal program for a systems safety evaluation and shall provide for adequate funding of the program. The safety program shall remain in effect through the entire life cycle (e.g. storage, use and disposal) of the system.

(3) Advise the Commander, Naval Sea Systems Command (SEA 04H) of plans for new or modified lithium batteries and all lithium powered equipment, for new or changes to processing methods, stowage, packaging and handling, shipping and usage; and plan and fund for necessary safety studies, tests and documentation. All Commands shall ensure that they neither introduce nor change lithium battery systems nor their related procedures and documentation without adequate safety studies. These safety studies, tests and documentation will be reviewed by the Commander of the Naval Sea Systems Command (SEA 04H) prior to recommendation of approval.

D. M. JOHNSON
Principal Deputy Commander
for Logistics

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USE, PACKING, STORAGE, TRANSPORTING, AND DISPOSAL OF LITHIUM BATTERIES

1. Acquisition

a. Programs anticipating the use of lithium batteries shall submit to the Naval Surface Weapons Center White Oak, Silver Spring MD 20910 via the Commander, Naval Sea Systems Command (SEA 04H) Washington, D. C. 20362 a data package validating the selection of the lithium battery and describing: (1) the proposed battery, e.g. design, geometry and electrochemical system, (2) the equipment: design, current drain, types of safety features, battery use, case strength, free volume, and the logistic and operational use sequence of the item in which the battery is to be used. Upon completion of a preliminary review, a safety assessment of the proposed battery use, including recommendations to enhance safety will be presented to the cognizant command by COMNAVSEASYSCOM.

b. Requests for a safety review in consideration of approval for service use are to be submitted to NAVSEASYSCOM (SEA 04H) and are to include the summarized results of the System Safety Program and the results of the test identified in enclosure (2). A recommendation for approval for service use will be predicated on this information.

c. All lithium cells shall be color coded and marked to indicate the information indicated in Figure 1. In addition to this information, the end item shall have an external label warning users of the hazards associated with lithium batteries and the unit packages shall be marked with the Hazardous Material Marking Symbol of NAVSUP Publication 4500 (Consolidated Hazardous Item List).

d. In development and procurement actions, applicable portions of the current issue of MIL-STD-882 (System Safety Program Requirements) should be invoked by contract.

e. Activities procuring batteries for limited or full scale production shall ensure that configuration management is imposed on the battery and its packaging in accordance with MIL-STD-480. In addition to the usual definition, a Class I change shall be defined as any change affecting safety characteristics of the battery, such as cell manufacturer, type, method of fabrication, insulation, fusing, circuit load changes, battery packaging, etc. Class I battery changes shall be coordinated with NSWC. Class I packaging changes shall be reviewed by personnel formally qualified in hazardous material packaging and qualified to sign a certificate of equivalency pursuant to reference (c).

f. Safety qualification testing for a specific application shall include environmental testing representative of the actual environments to be encountered by the complete end item, including battery, in the logistic cycle of that application.

g. Manufacturers shall be required to provide Material Safety Data sheets in accordance with DAR 7-104.98.

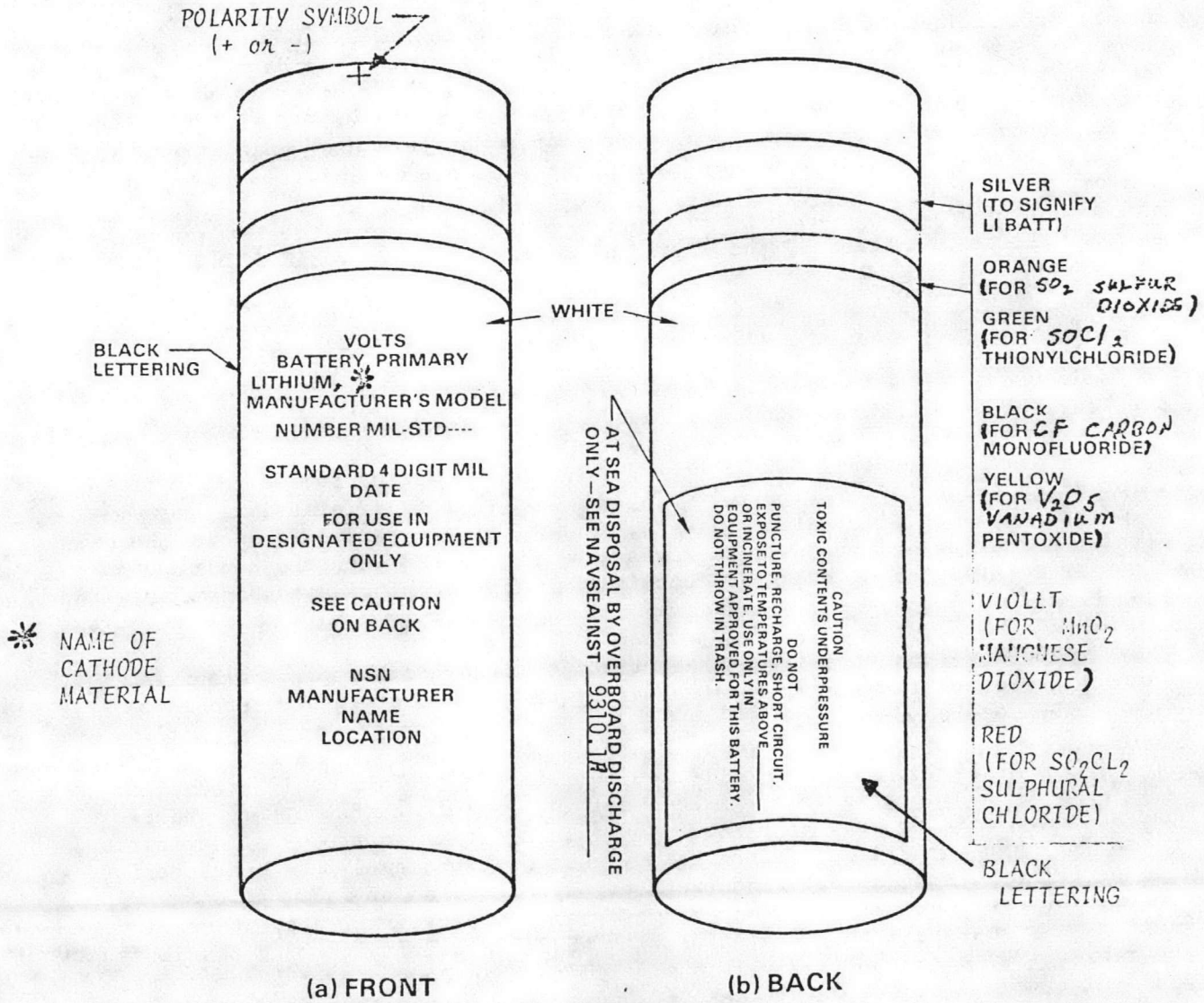

Fig. 1 LITHIUM CELL LABELING

2. Design

a. All unit cells shall be constructed so that the cell case to cover seal is a continuous weld, free from holes and other imperfections. The seal between the electrode and the cover shall be of the glass or ceramic to metal type and free from imperfections. Each cell, battery and battery enclosure must incorporate a safety venting device or be designed and manufactured in such a manner that will preclude a violent rupture condition. Nothing shall be done in the design and construction that will degrade the vent.

b. Each battery used as the power source shall contain a suitable over-current device that will fail open if the battery is discharged at an excessive rate. Batteries shall be overcurrent protected in the ground lead of each series string. Each separate circuit shall be protected. If the battery is tapped to provide different output voltages each tap shall be protected with an overcurrent device. In batteries consisting of series-parallel strings, the paralled strings shall be protected to prevent any possibility of charging.

c. Consideration shall be given to the use of thermal protection devices which will fail open at temperatures in excess of 91°C.

d. Select cells as small as possible for the task.

e. Lithium batteries shall be constructed so that they are not inter-changeable with commercial flashlight or radio batteries.

f. In development programs, assembly of batteries by user personnel shall be avoided.

g. Avoid potting of cells or batteries. If potting is essential, use only a material with good heat transfer characteristics and assure that cell vent operation will not be impeded or obstructed in any way.

h. If the battery is not installed in equipment, the leads or connector plug shall be taped, guarded or otherwise given positive protection against accidental shorting.

i. Design the equipment with a special compartment for the battery. This compartment shall have no interior projections or sharp edges that could deteriorate the insulation around the battery. The battery shall be secured within the compartment to resist shock and vibration for end item use.

j. Battery switches in the end item shall be carefully selected to prevent accidential battery turn-on.

3. Use

a. Lithium batteries shall be used only in their designed application.

b. Partially or fully discharged lithium batteries shall be removed from associated equipment upon completion of useful life and disposed of in accordance with paragraph 7. The exposed terminals shall be insulated to prevent short circuts.

c. In the event of an accident, incident or malfunction, either with or without visible damage to the battery, notify the appropriate authorities in accordance with the reporting procedures of Chapter 7 of OPNAVINST 5102.1 "Accident Investigation and Reporting". Report Symbol OPNAV 5102-2 is assigned the Material (property) Damage Report.

4. Packaging

For new lithium batteries, the basic packing, marking and shipping requirements imposed by the Department of Transportation are contained in Attachment A. In addition to the minimum requirements of Attachment A, Navy activities desiring to use lithium batteries shall:

(1) Ensure that a complete design disclosure is obtained on the packing of the specific battery, preferably prior to any shipment, but in any case no later than release for limited production or full scale production whichever occurs first.

(2) Ensure that the design disclosure is incorporated in the appropriate acquisition specification, contract and manuals. Descriptive specification language shall be supplemented by DOD-D-1000 Drawings or Figures in the specification as appropriate.

(3) Ensure that the adequacy of the packaging is demonstrated by tests and obtain a test report. The minimum package performance level is contained in MIL-STD-648. Other tests required by Attachment A shall also be performed.

(4) Ensure that where batteries are entered in the supply systems for organizational or intermediate maintenance level replacement, batteries so acquired are packaged so as to be capable of shipment by "cargo only" aircraft.

b. It may develop that it is impractical or undesirable logistically to distribute devices containing lithium batteries in packages conforming literally to the package specificatons listed in DOT-E-7052. In such cases, the cognizant SYSCOM official authorized to sign a Certification of Equivalency (COE) as delegated pursuant to reference (c) may do so when satisfied that the container proposed is of equal or greater strength and efficiency than those specified. The data package accompanying such requests shall contain:

(1) Results of safety tests required herein plus NAVSEASYSCOM (SEA 04H) recommendation for approval.

(2) Objective evidence (stress calculations may be used for sealed devices) that the container will meet performance requirements. To be approved for commercial cargo aircraft or for Military Aircraft transportation, evidence must show that any gas venting will be contained within the total package (device plus shipping container).

c. Used lithium batteries for disposal must be individually sealed in a plastic bag or be individually wrapped in electrical insulated material and be placed in DOT approved shipping containers in accordance with 49 CFR 13.206(f).

5. Storage

a. New lithium batteries shall be stored as follows:

(1) Lithium batteries shall be stored in their original shipping containers in a cool, sprinkler protected ventilated shelter.

(2) The storage area shall be isolated from other hazardous and combustible material and used only for the storage of unused lithium batteries.

(3) Since the effect of mass storage on the hazard degree is not known, the quantity stored in an area shall be kept to a reasonable minimum.

(4) Batteries in storage shall be retained in unit packages, preferably shipping containers, to prevent heat transfer between batteries.

(5) Storage temperature above 130°F shall be avoided.

(6) Special care shall be exercised in handling and moving containers to prevent crushing or puncturing.

b. Used lithium batteries shall be stored in the following manner:

(1) Used lithium batteries shall be packaged in accordance with paragraph 4c above.

(2) A remote collection point and storage area, sprinkler protected (if feasible), separate from other combustible material shall be established for batteries awaiting disposal.

(3) Used lithium batteries shall not be allowed to accumulate and disposal shall be effected promptly (no more than 30 lbs or 30 days).

(4) Lithium batteries are not to be disposed of nor transported with normally generated refuse.

(5) Used lithium batteries shall not be pierced, crushed, burned, dropped, cannibalized, dismantled, modified or otherwise carelessly handled, nor shall they be short circuited, charged or reused.

c. When entering a storage space in which lithium batteries may have vented gas, supplied air respirators or self-contained breathing apparatus approved by the National Institute for Operation Safety and Health (NIOSH) shall be worn.

6. Transportation

a. All transportation of new lithium batteries on public domain is controlled by federal law regulating shipment of hazardous materials. The general regulation is stated in 49 CFR 172.101, 173.206(e)(1) and 175.3. The Materials Transportation Bureau, Research and Special Programs Administration, U.S. Department of Transportation, Washington, D. C. 20590 has issued an exemption, (see attachment A) DOT-E 7052, which permits shipment of lithium

cells and batteries by motor vehicle, railfreight, cargo vessel and cargo-only aircraft provided the detailed requirements of the exemption have been met. Advise potential suppliers not listed in the lastest issue of Attachment A that they must become a party thereto prior to shipping batteries by any mode.

b. All transportation of used lithium batteries on public domain is controlled by federal law regulating shipment of hazardous materials. The Department of Transportation has issued an exemption,(see Attachment B) DOT-E-8441, which permits shipment of waste lithium batteries to a disposal site by motor vehicle only.

7. Disposal

a. At sea, batteries shall be disposed of by discharge overboard in deep water (in excess of 500 feet) outside the prohibited zone (50 mile limit). Do not store for shore disposal.

b. Ashore, batteries shall be disposed of as follows:

(1) Turn into the nearest Public Works Center for disposal by the Defense Logistics Agency (D.L.A.).

(2) Burn in an approved lithium battery incinerator. Details of such incinerators are available from SEA 04H.

(3) Buried in a controlled hazardous waste landfill.

SAFETY AND PERFORMANCE TEST FOR QUALIFICATION OF LITHIUM BATTERIES

1. General. This document establishes the minimum safety test requirements for lithium batteries in lithium battery powered equipment when used by the Navy or on Navy facilities. It also specifies the procedure, equipment and pass-fail criteria.

2. Pass-Fail Criteria. It is not necessary to regard a failure of the lithium batteries or lithium powered equipment to meet the "passing" criteria as grounds for an automatic rejection of the equipment for service use. Any such items which fail to meet such criteria will be rejected only if a technical evaluation of the test results by SEA 04H establishes that rejection is the appropriate course of action. The passing criteria are as follows:

(a) Unit Criteria

(1) Land	Unit has a fail safe vent system to keep pressure 50% below the yield point of the unit.
(2) Aircraft	Same as above except no external fire or flame.
(3) Surface Ship	Same as (2) above.
(4) Submarine	Total containment; generated internal pressure shall stay under 50% of the failure pressure of the housing.

(b) Relief Valve Criteria

(1) If pressure relief valves are provided in the unit they must prevent the pressure of all of the tests in paragraph 3 from reaching a peak value of 50% of the yield pressure of the unit. If the peak pressure falls below or is equal to 50% of the yield pressure of the unit in all of the tests the unit will be considered safe. If the peak pressure in any tests exceeds 50% of the yield pressure of the unit before venting that unit will be considered unsafe.

(2) If pressure relief valves are not provided the recorded peak pressure in any test must not exceed 50% of the failure pressure of the unit for the unit to be considered safe.

3. Test. The following tests are to evaluate the safety and performance of the lithium batteries and the lithium powered equipment:

WARNING: The following tests will most likely cause violent venting of batteries; therefore all possible safety precautions shall be observed.

a. TEST ITEMS A minimum of nine (9) units with batteries installed, along with two (2) spare battery packs, shall be provided.

b. TEST INSTRUMENTATION All three tests shall be instrumented as described in this paragraph. The instrumentation for the tests shall include six (6) thermocouples capable of measuring and withstanding temperatures up to 800°C, two (2) voltage test leads, one set of power leads and a pressure transducer capable of measuring pressure up to the failure pressure of the unit. Four (4) thermocouples shall be placed inside the unit in the following manner: one secured on each end of the battery pack, one secured at the center of the battery pack and one in the air space surrounding the battery pack. The remaining two (2) thermocouples shall be located and secured on the outside of the unit 180° apart near the battery pack. The pressure transducer shall continually monitor the pressure inside the battery pack housing.

c. CONSTANT CURRENT DISCHARGE & REVERSAL TEST This test shall consist of a constant current discharge using a DC power supply. The internal fusing shall be bypassed (shorted) and the discharge shall be performed at a current equal to the value of the battery pack fuse. After the battery voltage reaches zero volts the discharge shall be continued into voltage reversal at the same current for a time equivalent to 1.5 times the advertised ampere-hour capacity of the battery pack. This test shall be completed on three units; voltage, pressure and temperatures shall be continously monitored and recorded.

d. SHORT CIRCUIT TEST This test shall consist of shorting the battery (after all internal electrical safety devices have been bypassed) through a load of 0.01 ohm or less and leaving the load attached for not less than 24 hours. This test shall be completed on three units; voltage, current, pressure and temperature shall be continously monitored and recorded.

e. HIGH TEMPERATURE TEST This test shall consist of heating the battery pack inside the unit at a rate of 20°C rise per minute up to a temperature of 500°C. This test shall be completed on three units; voltage, pressure and temperature shall be continously monitored and recorded.

f. Parallel

DEPARTMENT OF THE NAVY
NAVAL HOSPITAL
CAMP LEJEUNE, N.C. 28542

IN REPLY REFER TO
371-dlm
6260.1
30 Dec 1983

From: Commanding Officer
To: Commanding General, 2d Force Service Support Group (Rein), FMFLant, Camp Lejeune, NC 28542

Subj: Industrial Hygiene Survey of Lithium/Sulfur Dioxide Batteries Storage Facilities in Bldg #1108; report of

Ref: (a) 1st Endorsement on CG, 2d FSSG ltr 42/RDB/jde, 1100 dtd 14 Oct 83
(b) Telephone Request from GySgt Page, SMU of 2 Dec 83
(c) CG, 2d FSSG MSG R 212153Z APR 83
(d) American Conference of Governmental Industrial Hygienists, Industrial Ventilation Manual

1. In response to references (a) and (b), the subject survey was conducted on 5 December 1983 by Mr. J. McCloskey, Environmental Health Technician. The basic letter of reference (a) addressed the need for interim storage facilities for Lithium batteries and suggests construction of an isolated chamber within Building #1108. The purpose of the survey was to evaluate health/safety conditions connected with this storage.

2. Background. The highly energetic nature of Lithium/Sulfur Dioxide (Li/SO_2) batteries requires that certain precautions be employed for their handling and storage. Inappropriate or careless application of these cautions has resulted in venting of internal gases, explosions and fires. The following dangers are associated with indiscriminate handling, storage, use and disposal of Li/SO_2 batteries:

a. Venting and expulsion of SO_2 gas and electrolytes which are noxious to the eyes and mucous membranes of the nasal passage and mouth are a respiratory irritant. Venting may be caused by a high rate of discharge (shorting), over-discharge or excessive temperature exposure.

b. Violent explosion and fire of near fully discharged, shorted or over-discharged cells that were abused either thermally or mechanically by crushing or puncturing.

c. Venting of cyanide and methane gases under conditions associated with discharging of battery cells.

3. Findings. At present, stocks of new Li/SO_2 batteries are maintained in a corner of a warehouse bay in Bldg. #1108 pending distribution to using activities. The area is separated from other storage sections by traffic lanes but there are no physical barriers. There is no ventilation in the corner other than what occurs naturally. A steam heating unit is located directly over head and there is a large window on the outside wall. Storage of up to 7000 batteries may be anticipated at any given time. One check-in procedure involves opening cartons to inspect the condition of individual

Subj: Industrial Hygiene Survey of Lithium/Sulfur Dioxide Batteries Storage Facilities in Bldg #1108; report of

batteries. On occasion a pungent odor which suggests SO_2 venting has been reported. Personnel have also experienced slight "burning" effects on the exposed skin.

4. Comments and Recommendations. Use of general purpose warehouse space for temporary storage of Li/SO_2 batteries is permitted by reference (c). However, in Bldg #1108 certain construction and handling/procedural modifications are felt to be necessary to minimize danger to personnel and property. The following recommendations are submitted:

a. The space to be used for storage of batteries should be completely enclosed and exclude the over head heater and the window area.

b. The enclosed area should be of a size which will accommodate the maximum number of batteries expected to be stored at any one time.

c. To aid in temperature control (room temperatures should not exceed 130°F) and remove toxic gases/fumes a mechanical exhaust system should be installed. Capture of toxic gases/fumes should be, at least, 100 feet/minute at the point of containment release. To achieve this velocity throughout the space supplementary provisions for make up air may be necessary. Also, to provide uniformity of air delivery and eliminate pockets of "dead space" multiple entry points for make up air are usually best. Since methane is an explosive gas exhaust fans should be of the non-spark variety. The exhaust discharge stack should be located above the roof high enough to permit good dispersion of contaminated air. Design of ventilation systems should adhere to the principles established in reference (d).

d. Personal protective measures should include respiratory, skin and eye protection. Reference (c) calls for the use of supplied air or self-contained breathing apparatus in spaces where Lithium batteries have vented or are venting. Considering the variety of toxic agents which may be present and reports of symptoms experienced by personnel during routine check-in procedures, full face supplied air respirators are recommended during these periods which may extend up to ten hours. Lightweight respirators which will provide the necessary protection are available through open purchase.

G. L. WINTERS
By direction

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AC/S, Facilities
CO, 2d Sup Bn
OIC, SMU
Med Off, 2d FSSG
Saf Off, 2d FSSG
Base Maint Off
Base Fire Prev Div
→ NREAD

File 6240 BFAC

ROUTINE *U N C L A S S I F I E D*

09 /2237Z PT00283 PAGE 01

NREA 4-7-83

Doug For your info

RT ZYUW RUEACMC1123 0942234-UUUU--RUEBDOA.
ZNR UUUUU
R 301405Z MAR 83
FM CMC WASHINGTON DC
TO RUEBUAR/HQ DPDS BATTLE CREEK MI//DPDS-HEA//
INFO RUCLRGA/DGSC RICHMOND VA
RUEAHOF/COMNAVFACENGCOM ALEXANDRIA VA
RULSSAA/COMNAVSUPSYSCOM WASHINGTON DC
RUEADWD/HQ DA WASHINGTON DC//DALO-SM//
RUEDRIA/CDRCECOM FT MONMOUTH NJ //DRSEL-SF-MS/DRSEL-SF-ME//
RUVAFLC/HQ AFLC WRIGHT-PATTERSON AFB OH//LOLP//
RUVMAAA/DIR MAT MGT MCCLELLAN AFB CA//MMIR//
RUEBJGA/COMDT COGUARD WASHINGTON DC
RUKLDAR/CDRDARCOM ALEXANDRIA VA //DRCRE//
RUEBEHA/CDRERADCOM ADELPHI MD //DRDEL-SS//
RUEBDSA/DLA CAMERON STA VA//DLA-SM//
RUEOLFA/CG FMFLANT
RUHQHOA/CG FMFPAC
RULYLKA/CG LFTCLANT NORFOLK VA
RHCGSRA/CG FOURTH FSSG
RUWJNKA/MCCES TWENTYNINE PALMS CA
RUEBAHA/MARBKS GUANTANAMO BAY CUBA

FAC ROUTING
ACTION INFO INIT
SEC
CLK

PAGE 02 RUEACMC1123 UNCLAS
AIG EIGHT
XMT CG MCRD PARRIS ISLAND SC
CG MCRD SAN DIEGO CA
HQBN HQMC ARLINGTON VA
MARBKS WASHINGTON DC
FIRST MARCORDIST GARDEN CITY LI NY
MARFINCEN KANSAS CITY MO
BT
UNCLAS //N02900//
SUBJ: ACCOUNTABILITY FOR AND PHYSICAL CUSTODY OF LITHIUM SULFUR DIOXIDE (LISO2) BATTERIES (CMC CODE LMA-3/LMM-2)
A. HQ DPDS BATTLE CREEK MI 101349Z FEB 83 (NOTAL)
1. THE REF PROVIDES DPDS POLICY ON THE SUBJ. WE CONCUR IN THE REF'S POLICY REGARDING:
A. REQUIRED BATTERY IDENTIFICATION/CERTIFICATION INFORMATION (BALANCED VS UNBALANCED CELL BATTERIES).
B. PACKAGING OF BATTERIES FOR TURN-IN (SEE PARA 5 BELOW FOR ADDITIONAL INFO).
C. REQUIREMENT FOR DPDO'S TO POSSESS CONFORMING (OR MOST-NEARLY-CONFORMING) STORAGE CAPABILITIES TO ACCEPT PHYSICAL CUSTODY OF

PAGE 03 RUEACMC1123 UNCLAS
LITHIUM BATTERIES.

ROUTINE *U N C L A S S I F I E D*

3Ø 14 Ø5Z MAR 83

2. FURTHER, WE CONCUR IN THE REF'S POLICY REGARDING CONTINUED USER RESPONSIBILITY FOR PHYSICAL CUSTODY (ACCOUNTABILITY TO DPDO) OF UNBALANCED CELL LITHIUM BATTERIES. HOWEVER, OUR CONCURRENCE IN THIS ITEM IS PREDICATED UPON THE IMMINENT DPDS ISSUANCE OF A CONTRACT WHICH WILL EFFECT NEAR-TERM PICK-UP OF UNBALANCED CELL BATTERIES FROM CURRENT USMC HOLDERS. IF BATTERIES ARE NOT TO BE PICKED UP BY 30 JUNE 83, OUR COMMENT IN PARA 4 BELOW PERTAINS.
3. WE DO NOT CONCUR IN THE REF'S IMPLIED POLICY REGARDING NON-ACCEPTANCE OF ACCOUNTABILITY IF THE DPDO DOES NOT POSSESS CONFORMING OR MOST-NEARLY-CONFORMING STORAGE CAPABILITIES. NOR DO WE CONCUR IN REF'S STATEMENT THAT, FOR DPDO'S TO ACCEPT ACCOUNTABILITY AND PHYSICAL CUSTODY, "THE BATTERIES MUST BE NON-LEAKING AND SAFE TO HANDLE".
4. IT IS OUR POSITION THAT DPDO'S AND OFF-SITE-BRANCHES SHOULD ACCEPT ACCOUNTABILITY FOR ALL LITHIUM BATTERIES REQUIRING DISPOSAL, REGARDLESS OF BATTERY CONDITION, AND THAT THE RESPONSIBILITY FOR PHYSICAL CUSTODY OF DAMAGED/PHYSICALLY ALTERED LITHIUM BATTERIES SHOULD BE ASSIGNED IN THE SAME MANNER AS THAT FOR "SAFE" LITHIUM BATTERIES, I.E. TO THE AGENCY/OFFICE HAVING CONFORMING OR MOST-NEARLY-CONFORMING STORAGE CAPABILITIES. RATIONALE:

PAGE 04 RUEACMC1123 UNCLAS
A. THAT CONTROLLED DISPOSAL OF LITHIUM BATTERIES (HAZARDOUS MATERIAL) IS REQUIRED AND MOST EFFICIENTLY PERFORMED VIA DPDS CHANNELS.
B. THAT CONTROLLED STORAGE OF DEPLETED LITHIUM BATTERIES (PENDING DISPOSAL) IS REQUIRED AND THAT, AT ANY GIVEN FACILITY, THE STORAGE LOCATION SHOULD BE THE ONE BEST QUALIFIED UNDER CONFORMING OR MOST NEARLY CONFORMING GUIDELINES.
C. THAT DAMAGED/PHYSICALLY ALTERED LITHIUM BATTERIES, WHEN APPROPRIATELY PACKAGED (SEE PARA 5 BELOW), ALSO REQUIRE DISPOSAL AND QUALIFY FOR TEMPORARY STORAGE (PENDING DISPOSAL) AT THE SELECTED CONFORMING OR MOST-NEARLY-CONFORMING STORAGE SITE.
D. THAT CONFORMING OR MOST-NEARLY-CONFORMING STORAGE SITES MAY, DEPENDING UPON THE FACILITY IN QUESTION, BE UNDER THE CONTROL OF THE TENANT DPDO OR OFF-SITE-BRANCH.
5. PACKAGING LITHIUM BATTERIES FOR TEMPORARY STORAGE, PENDING DISPOSAL:
A. WE ARE ADVISING OUR LITHIUM BATTERY USERS TO REPACKAGE USED/DEPLETED LITHIUM BATTERIES IN THEIR ORIGINAL SHIPPING CONTAINERS (OR SIMILAR, STURDY CONTAINERS) FOR TURN-IN. THE STURDY CONTAINERS WILL PROVIDE MORE BATTERY PROTECTION FOR INCIDENTAL HANDLING AND

PAGE 05 RUEACMC1123 UNCLAS
LOCAL TRANSPORT TO THE STORAGE/DISPOSAL SITE. THE CONTAINERS WILL ALSO FACILITATE ORDERLY STACKING AND INVENTORY CONTROL AT THE STORAGE SITE.
B. AS TO DAMAGED/PHYSICALLY ALTERED LITHIUM BATTERIES, WE BELIEVE

THAT THE FOLLOWING PACKAGING AND TEMPORARY STORAGE PROCEDURES WILL ALLOW SAFE HANDLING OF SUCH BATTERIES IN THE DISPOSAL PROCESS:
(1) DAMAGED BATTERIES ARE TO BE ALLOWED TO STABILIZE FOR A MINIMUM OF FOUR HOURS PRIOR TO HANDLING/PACKAGING (BATTERIES MUST BE COOL TO TOUCH).
(2) EACH BATTERY IS TO BE SECURELY SEALED WITHIN A NON-POROUS AND TIGHTLY SEALED PLASTIC BAG TO PREVENT ESCAPE OF OR ACCESS TO BATTERY ELEMENTS/COMPOUNDS. IF THE BATTERY HAS SHARP PROTRUSIONS WHICH MIGHT DESTROY THE PLASTIC SEAL, THE BATTERY SHALL BE PLACED IN A CARTON AND THE CARTON SEALED IN A PLASTIC BAG.
(3) PLASTIC ENCASED BATTERIES ARE TO BE SECURELY PACKAGED WITHIN STURDY CONTAINERS HAVING A VENT CAPABILITY, WITH THE CONTAINERS APPROPRIATELY MARKED AS CONTAINING DAMAGED BATTERIES.
(4) CONTAINERS MAY BE STORED WITH BUT SHOULD BE STACKED SEPARATELY FROM "UNDAMAGED" LITHIUM BATTERIES OR OTHER COMBUSTIBLE MATERIAL, PREFERABLY IN A CONTROLLED, DRY, WELL VENTILATED AREA.

PAGE 06 RUEACMC1123 UNCLAS
6. REQUEST ADVISE ON ACCEPTABILITY OF OUR POSITION RE: DPDO/OFF-SITE-BRANCH ACCOUNTABILITY FOR ALL LITHIUM BATTERIES REQUIRING DISPOSAL, PHYSICAL CUSTODY RESPONSIBILITY IAW CONTROL OF CONFORMING/MOST NEARLY CONFORMING STORAGE CAPABILITY, AND PACKAGING/STORAGE PROCEDURES FOR DAMAGED/PHYSICALLY ALTERED BATTERIES. FURTHER, REQUEST ADVISE ON PROJECTED CAPABILITY TO EFFECT PICK-UP OF UNBALANCED LITHIUM BATTERIES BY 30 JUNE 83.
7. YOUR EXPEDITIOUS RESPONSE TO THE ABOVE WILL BE APPRECIATED:
HQMC POC IS LTCOL W. N. LOWE, LMA-3, (A) 224-2039.
BT
#1123

NNNN

INFO|BFAC|EADJ|BCEO|BTEL|327

NATURAL RESOURCES AND ENVIRONMENTAL AFFAIRS DIVISION
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA 28542

6-6-83
Date

From: Director
To: Danny
Subj:

1. I attempted to get up with Maj Reinhart concerning batteries. He didn't call back.

Julian

101337 2 June 83

Eggers - 387
Rhinehart - 900 ("Suspect")

MEMORANDUM OF CALL

Previous editions usable

TO: Julian

☑ YOU WERE CALLED BY– ☐ YOU WERE VISITED BY–

MAJ RINEHART

OF (Organization)

G-4 2d MAR DIV

☑ PLEASE PHONE ▶ ☐ FTS ☐ AUTOVON

2516

☒ WILL CALL AGAIN ☐ IS WAITING TO SEE YOU

☐ RETURNED YOUR CALL ☐ WISHES AN APPOINTMENT

MESSAGE

DISPOSAL of 200 BATTERIES

RECEIVED BY Th DATE TIME

63-110 NSN 7540-00-634-4018 STANDARD FORM 63 (Rev. 8-81)
Prescribed by GSA
☆U.S. G.P.O. 1982-361-529/159 FPMR (41 CFR) 101—11.6

Dan,

For your info

PRIORITY

****
* U N C L A S S I F I E D *
****

155/1716Z PT00260 PAGE 01

PT TUZYUW RUEACMC2002 1551609-UUUU--RUEBDOA.
ZNR UUUUU
P 041803Z JUN 83
FM CMC WASHINGTON DC
TO RUEOLFA/CG FMFLANT
RUHQHQA/CG FMFPAC
RULYLKA/CG LFTCLANT NORFOLK VA
RHCGSRA/CG FOURTH FSSG
RUWJNKA/MCCES TWENTYNINE PALMS CA
RUEBAHA/MARBKS GUANTANAMO BAY CUBA
AIG FIGHT
INFO RUEDBIA/CDRCFCOM FT MONMOUTH NJ //DR
RUEDBIA/CDRFRADCOM FT MONMOUTH NJ //DELET PR//
RUEBEHA/CDRFRADCOM ADELPHI MD //DRDEL-SS//
XMT CG MCRD PARRIS ISLAND SC
CG MCRD SAN DIEGO CA
HQBN HQMC ARLINGTON VA
MARBKS WASHINGTON DC
FIRST MARCORDIST GARDEN CITY LI NY
MARFINCEN KNASAS CITY MO
BT
UNCLAS //N04400//

BFAC

COMT TO CEO FD Bmo NREA
6 JUN 83

FAC ROUTING			
	ACTION	INFO	INT
FACO			
4A			
4B			
4C			
4D			
4E			
4FC			
4LC			
SEC			
CLK			

PAGE 02 RUEACMC2002 UNCLAS

SUBJ: SAFETY OF USE MESSAGE, ADVISORY, TECHNICAL, BATTERY BA-5590, NSN 6135-01-036-3495, CONTRACTS DAAB07-80-D-6502, MALLORY AND DAAB07-81-D-6526, DURACELL (CMC CODE LMA-3)
NOTE: THIS IS A SAFETY ADVISORY MESSAGE THAT HAS NOT, REPEAT HAS NOT, BEEN TRANSMITTED TO UNITS SUBORDINATE TO ADDRESSEES. ADDRESSEES SHOULD IMMEDIATELY RETRANSMIT THIS MESSAGE TO ALL SUBORDINATE UNITS, ACTIVITIES OR ELEMENTS AFFECTED OR CONCERNED.
A. CMC WASHINGTON DC 151402Z APR 83
1. THE REF DIRECTED THE INSPECTION AND REMOVAL FROM SERVICE OF BATTERIES FROM CONTRACT DAAB07-80-D-6502 HAVING A DATE OF MFR OF 1080. ADDEES AND SUBORDINATE USERS HAVE REPORTED (AS OF THIS DATE) ON-HAND QUANTITIES OA APPARENTLY DEFECTIVE BATTERIES AS FOLLOWS:

CONTRACT	MFR	MFR DATE	QTY
DAAB07-80-D-6502	MALLORY	1080	46
		1180	1
		1280	1
DAAB07-81-D-6526	DURACELL	1181	1
		0382	4

2. A 3JUN83 INCIDENT AT MCAS CHERRY PT INDICATES A POTENTIAL INCREASE IN THE VOLATILITY OF THE BATTERIES IDENTIFIED AS DEFECTIVE. ACCORD-

PAGE 03 RUEACMC2002 UNCLAS

****
* U N C L A S S I F I E D *
****

PRIORITY

04 14 03Z Jun 83

INGLY. HOLDERS OF THE DEFECTIVE BATTERIES ARE TO:
A. ENSURE MINIMUM AND CAUTTOUS HANDLING OF THE DEFECTIVE BATTERIES.
B. ENSURE THAT DEFECTIVE BATTERIES ARE STORED IN A LIMITED/RESTRICTED ACCESS. COOL. WELL VENTILATED LOCATION.
3. PENDING RECEIPT OF FURTHER INFO (THRU INVESTIGATION OF THE ABOVE NOTED INCIDENT) ALL OTHER BA-5590 LITHIUM BATTERIES MANUFACTURED UNDER THE CONTRACTS NOTED BY THIS MESSAGE (REGARDLESS OF MFR DATE) ARE TO BE CONSIDERED SUSPECT. THEY ARE TO BE HANDLED WITH DUE CARE AND USED ONLY WHEN ABSOLUTELY REQUIRED. PRIOR TO ANY HANDLING/USAGE. THE BATTERIES ARE TO BE VISUALLY INSPECTED FOR ANY INDICATION OF DETERIORATION. MOISTURE WITHIN OR DISTENSION OF THE PLASTIC BAG/WRAP. BATTERIES ARE TO BE OPENED CAREFULLY IN A WELL VENTILATED AREA AND ARE TO BE HELD AWAY FROM THE FACE WHEN REMOVING THE PLASTIC BAG/WRAP.
4. FURTHER DISPOSITION INSTR FOR DEFECTIVE BATTERIES WILL BE PROVIDED OLLOWING INVESTIGATION OF THE INCIDENT AND DETERMINATION OF BATTERY DETERIORATION CAUSE/EFFECT.
5. HQMC POC IS LTCOL W. N. LOWE. LMA-3. (A) 224-2039.
BT
#2002

NNNN

ACT|BLOG
INFO|DSSC|FSMO|DOST|MCEX|BFAC|BADJ|131

Danny Sharpe
B&W
RTS

ROUTINE
****
* UNCLASSIFIED *
****

055/2147Z PT00368 PAGE 01

RTTUZYUW RUEPUAB9781 0551957-UUUU--RUEBDOA.
ZNR UUUUU
R 2412057 FEB 82
FM HQ DPDS BATTLE CREEK MI
TO AIG 4573 //ACT: DPDO//
BT
UNCLAS DPDS-ROS 1034. SUBJ: DISPOSAL OF MERCURY BATTERIES, TYPE BA-1567/U NSN: 6135-00-485-7402 AND BA-1100/U NSN: 6135-00-926-0827, GENERATED BY U.S. ARMY ACTIVITIES.
1. REF MSG DPDS-ROS, DTG 101708Z JUL 79, SUBJ: POTENTIAL SAFETY HAZARD BATTERY BA-1567/U.
2. REF'D MSG INSTRUCTED DPDOS NOT TO ACCEPT SUBJ BATTERIES FROM USERS UNLESS RENDERED INNOCUOUS BY THE GENERATING ACTIVITY. THE BATTERIES HAVE BEEN DETERMINED TO BE A POTENTIAL SAFETY HAZARD IF THEY DISPLAY BULGING OF THE POSITIVE TERMINAL OR ARE TIGHT IN THEIR PLASTIC SLEEVE. THE BATTERIES ARE KNOWN TO BE USED IN THE FOLLOWING:

EQUIPMENT	BATTERY	EQUIPMENT NSN
AN/PVS-1	BA-1100	5855-00-087-2942
AN/PVS-2	BA-1100	5855-00-087-2947
AN/PVS-2A	BA-1100	5855-00-179-3708
AN/PVS-2B	BA-1100	5855-00-760-3869
AN/PVS-4	BA-1567	5855-00-629-5334

PAGE 2 RUEPUAB9781 UNCLAS

AN/PVS-5	BA-1567	5855-00-150-1820
AN/TVS-2	BA-1100	5855-00-087-3144
AN/TVS-2A	BA-1100	5855-00-791-3358
AN/TVS-4	BA-1100	5855-00-906-0994
AN/TVS-5	BA-1567	5855-00-629-5327
AN/PAQ-4	BA-1567	5855-01-107-5925
AN/VVS-2(V)1	BA-1567	5855-00-629-5278
AN/VVS-2(V)2	BA-1567	5855-00-057-1880

U.S. ARMY ACTIVITIES HAVE BEEN INSTRUCTED NOT TO SHIP ABOVE EQUIPMENT WITH A BATTERY INSTALLED. THEREFORE, DPDOS SHOULD NOT RECEIVE THE ABOVE EQUIPMENT WITH A BATTERY INSTALLED.
3. DURACELL INTERNATIONAL INC. (FORMERLY MALLORY BATTERY CORP.) HAS DEVELOPED PROCEDURES TO RENDER SUBJ BATTERIES SAFE TO HANDLE. THE ARMY AND DPDS HAVE AGREED ON A MODIFIED VERSION OF THOSE PROCEDURES FOR ARMY GENERATING ACTIVITIES AS FOLLOWS:
A. PRIOR TO TURN-IN TO THE DPDO:
(1) WEAR A FULL FACE SHIELD AND NON-POROUS NEOPRENE OR RUBBER GLOVES AND APRON. THESE BATTERIES CONTAIN METALLIC MERCURY, MERCURIC OXIDE AND POTASSIUM HYDROXIDE ELECTROLYTE (CAUSTIC). THE POTASSIUM HYDROXIDE IS EXTREMELY CORROSIVE AND WILL CAUSE CHEMICAL BURNS TO THE EYES AND

PAGE 3 RUEPUAB9781 UNCLAS
SKIN. THE METALLIC MERCURY AND MERCURIC OXIDE ARE TOXIC TO BOTH

ROUTINE
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* UNCLASSIFIED *
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24 12 052FEB82

PERSONNEL AND THE ENVIRONMENT. IN CASE OF CONTAMINATION, FLUSH THE AFFECTED PART OF THE BODY WITH CLEAR RUNNING WATER FOR AT LEAST 15 MINUTES. GET MEDICAL HELP IMMEDIATELY.
(2) HANDLE ANY BULGED CELLS CAREFULLY. THEY MAY RUPTURE.
BATTERIES SHOULD BE PLACED IN A CLEAN STEEL DRUM/BARREL OF APPROPRIATE SIZE, DEPENDING UPON THE NUMBER OF DEFECTIVE BATTERIES WHICH MUST BE DISPOSED OF. LIMIT THE NUMBER OF BATTERIES PER DRUM SO THAT IT CONTAINS NOT MORE THAN 50 LBS OF BATTERIES OR IS NOT MORE THAN 1/3 FULL OF BATTERIES, WHICHEVER IS LESS. DRUMS SHOULD HAVE A FULL REMOVAL HEAD, CAPABLE OF BEING SEALED.
PREFERRED IS A DEPARTMENT OF TRANSPORTATION (D.O.T.) SPECIFICATION 5 OR 5A METAL DRUM. FOR A 55 GALLON DRUM USE NSN 8110-00-823-8121. THESE MEET FED-SPEC PPP-D-729, TYPE IV. DRUMS OF LESSER CAPACITY, MEETING MIL-D-6054 ARE: 19 GALLON, NSN 8110-00-753-4643, 22 GALLON, NSN 8110-00-044-2984, 27 GALLON, NSN 8110-00-082-2625.
THE INSTALLATION TRANSPORTATION OFFICE MAY BE OF ASSISTANCE IN OBTAINING THESE DRUMS.
THESE DRUMS SHOULD BE FILLED APPROXIMATELY 3/4 FULL OF WATER.
50 LBS EQUALS APPROXIMATELY 90 BA-1100/U BATTERIES OR 730 BA-1567/U

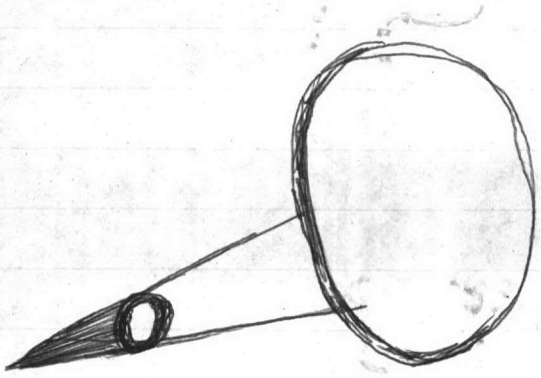
PAGE 4 RUEPUAB9781 UNCLAS
BATTERIES.
DRUMS MUST BE STORED IN COVERED AND WELL DRAINED OPEN STORAGE AREAS AND KEPT AWAY FROM OPEN FLAME AND HEAT DUE TO THE POSSIBLE PRESENCE OF MERCURY VAPOR AND HYDROGEN GAS. AFTER 30 DAYS OF THIS WATER TREATMENT, ADD SOME BORIC ACID SOLUTION OR WHITE VINEGAR TO THE WATER TO HELP NEUTRALIZE THE POTASSIUM HYDROXIDE THAT MAY HAVE CONTAMINATED THE WATER.
NOTE: THE FOLLOWING AMOUNTS ARE THE MAXIMUM NECESSARY TO NEUTRALIZE ALL THE POTASSIUM HYDROXIDE CONTAINED IN 50 LBS OF BATIERIES. LESS MAY BE NEEDED IN SOME INSTANCES.
WHEN USING VINEGAR ADD: 11.8 LITERS (12.5 QUARTS) OF VINEGAR FOR 50 LBS OF BA-1100 BATTERIES OR 8.1 LITERS (8.6 QUARTS) OF VINEGAR FOR 50 LBS OF BA-1567 BATTERIES. USE AN APPROPRIATE INTERMEDIATE VALUE FOR A MIX OF BATTERIES.
WHEN USING BORIC ACID ADD: 766 GRAMS (27 OZ.) OF DRY BORIC ACID DISSOLVED IN APPROXIMATELY 14 LITERS (3.5 GALLONS) OF WATER FOR 50 LBS OF BA-1100 BATTERIES OR 566 GRAMS (20 OZ.) OF BORIC ACID DISSOLVED IN APPROXIMATELY 12 LITERS (3 GALLONS) OF WATER FOR 50 LBS OF BA-1567 BATTERIES. USE AN APPROPRIATE INTERMEDIATE VALUE FOR A MIX OF BATTERIES.
THE DRUMS MUST THEN BE LABELED "WASTE MERCURY BATTERIES AND WATER CONTAMINATED WITH RESIDUES OF LEAKING MERCURY BATTERIES."

PAGE 5 RUEPUAB9781 UNCLAS
THE BATTERIES NOW POSE NO EXPLOSION HAZARD AND ARE CONSIDERED SAFE.
THE WATER IN THE DRUMS, HOWEVER, MAY BE CONTAMINATED WITH RESIDUE FROM LEAKING BATIERIES (I.E., MERCURY, MERCURY OXIDE, POTASSIUM HYDROXIDE).
B. AFTER ACCOMPLISHING THE PRECEDING, A TURN-IN MAY BE MADE TO THE

DPDO. TURN-IN SHOULD BE ACCOUNTABILITY ONLY. THE DTID SHOULD BE MARKED HM IN BLOCK C OF THE DD FORM 1348-1. THE SCRAP SHOULD BE PROCESSED FOR SALE OR ABANDONMENT IN AN EPA PERMITTED HAZARDOUS WASTE LANDFILL THROUGH SERVICE CONTRACT.
4. DPDS IS COORDINATING PROCEDURES FOR USE BY AIR FORCE AND NAVY/ MARINE CORPS ACTIVITIES. YOU WILL BE NOTIFIED WHEN PROCEDURES ARE FINALIZED.
BT
#9781

NNNN

DPDO /126



RAdCom

081600 June 83

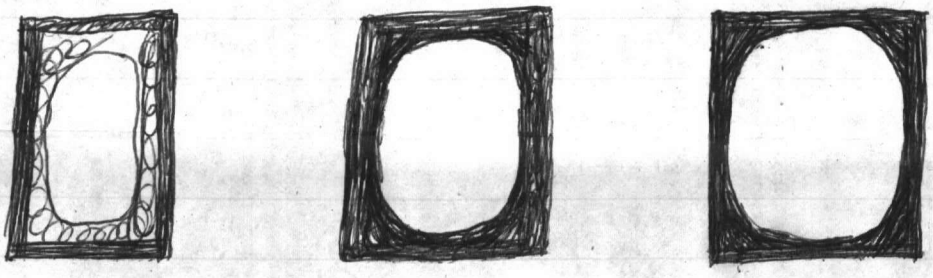
121403 June 83
(08)

091403 June 83

Expended	Batteries {Sulfuras acid}

3 June

Heat + Moisture



{Organic Vapor Masks}

Contract #
6502-
10/80
11/80
12/80

5598
Pick-77

Contract #
6526
11/81
3/83

Contract
6036

8140 37 June 83

Suspense f/r

H M/H W

Oil Poll. Abatement

Environ Planning

6240

6280

9000

11000

12000

Budget/Property

Environmetal Planning

Admin/Safety

100-

Geoge Eggers

Mike Cervanak

King

Cervanak

Eggers

(382) Ballers

900 total

100

Danny,

For your info

Julian

Danny

I understand you are in a meeting concerning $LiSO_2$ batteries.

Jehan

ASSISTANT CHIEF OF STAFF, FACILITIES
HEADQUARTERS, MARINE CORPS BASE

DATE 10 Jan 83

TO: Dir, NREA

BASE MAINT O	DIR, FAMILY HOUSING
PUBLIC WORKS O	DIR, UNACCOMPANIED PERS HSG
COMM-ELECT O	BASE FIRE CHIEF

ATTN: MR Wauten

1. Attached is forwarded for info/action.

2. Please initial, or comment, and return all papers to this office.

3. Your file copy

J. A. Fitzgerald

"LET'S THINK OF A FEW REASONS
WHY IT CAN BE DONE"

MCBCL 5216/21 (REV. 2-81)

ROUTINE

****
* U N C L A S S I F I E D *
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160/0253Z PT00052 PAGE 01

69

FAC

C/S Do we sh... process on ...

RTTUZYUW RUCLFTA1946 1591707-UUUU--RUEBDOA.
ZNR UUUUU
R 0815407 JUN 83
FM DPDR MEMPHIS TN
TO AIG 4544
BT
UNCLAS DPDR-MR 278083 PASS TO DEFENSE PROPERTY DISPOSAL OFFICE
SUBJECT: UNSAFE LITHIUM SULFUR DIOXIDE BATTERIES (LISO2)
REF DPDS-HEA 3396, DTG 021233Z JUN 83, SUBJECT: LITHIUM
BATTERY ADVISORIES (NOTAL)
1. CECOM HAS ADVISED DPDS OF A PROBLEM WITH LEAKAGE
ASSOCIATED WITH LISO2 BATTERIES, NSN 6135-01-036-3495 SERIAL
NO. B-5590/U UNDER CONTRACT #DAAB07-80-D-6502, MANUFACTURED
BY DURACELL INT'L, INC, WITH MANUFACTURE LOT DATE CODE OF
OCT 80 (1080) THRU DEC 80 (1280). THESE BATTERIES ARE NOT TO
BE USED UNTIL THE CAUSE OF FAILURE HAS BEEN DETERMINED.
ACTIONS SHOULD BE INITIATED TO FREEZE THESE BATTERIES UPON
RECEIPT UTILIZING A FREEZE CODE "8".
2. DPDS WAS ALSO ADVISED OF A VENTING PROBLEM ASSOCIATED

T. M. STOKES, JR.

PAGE 2 RUCLFTA1946 UNCLAS
WITH LISO2 BATTERIES, NSN 6135-01-034-2239, SERIAL NO
B-5598/U UNDER CONTRACT #DAAB07-79-D-6721 MANUFACTURER BY
POWER CONVERSION, INC. THESE BATTERIES SHOULD BE FROZEN
UPON RECEIPT UNTIL OTHERWISE ADVISED.
3. AN INTERROGATION OF IDMS HAS REVEALED THE FOLLOWING
DPDOS MAY HAVE THESE BATTERIES: NSN 6135-01-036-3495-

BRAGG	STEWART	SAN ANTONIO	TAMPA
DYESS	ALBANY	HOOD	EGLIN
LEJEUNE	JACKSON	LITTLEROCK	PANAMA
CHERRY POINT	SILL	HOMESTEAD	

NSN 6135-01-034-2239 - BRAGG CHARLESTON DYESS
4. ALL DPDOS ARE ADVISED TO CHECK THEIR INVENTORIES FOR
SUBJECT BATTERIES. SHOULD THE DPDO HAVE PHYSICAL CUSTODY
OF ANY OF THESE BATTERIES, THE HOST SAFETY AND ENVIRONMENTAL
OFFICERS SHOULD BE NOTIFIED AT ONCE TO DETERMINE THE
OPTIMAL STORAGE LOCATION
5. AGAIN, THESE BATTERIES MUST NOT BE REUTILIZED, TRANSFERRED,
DONATED OR SOLD UNTIL THE CAUSE OF FAILURE HAS BEEN DETERMINED
6. FOR FURTHER INFORMATION, CONTACT THIS OFFICE, DPDR-MR/
ANGELLA OWENS, (AV) 966-9866.
BT
#1946

NNNN

DPDO|136

ROUTINE

****
* U N C L A S S I F I E D *
****

0815Z Jun83

LITHIUM BATTERIES

HQMC POC:

LTCOL W N LOWE
LMA-3

LITHIUM BATTERIES

BENEFITS

- HIGH CELL VOLTAGE (2x GAIN)
- HIGH ENERGY DENSITY (2-4x ZINC/MAGNESIUM)
- HIGH POWER DENSITY
- LOW TEMP PERFORMANCE (-65F vs 0F)
- FLAT DISCHARGE RATE
- SUPERIOR SHELF LIFE (5 YRS @ ROOM TEMP)

HAZARDS

- TOXIC (SULFUR DIOXIDE)
- VENT / EXPLOSION
- FLAMMABLE

LITHIUM BATTERIES

PROBLEM AREAS

- STORAGE / PACKAGING
- TRANSPORTATION
- DISPOSAL
- OPERATIONAL USE

LITHIUM BATTERIES

STORAGE--PACKAGING PROBLEMS

- SUBJECT TO HAZARDOUS MATERIEL REGS
- FACILITIES:
  - VENTILATION
  - FIRE PROTECTION
  - SEGREGATION
- PACKAGING:
  - ORIGINAL CONTAINERS
  - ALTERNATIVE CONTAINERS (ODD LOTS, INDIV)
  - CONSIDERATIONS (VENTING, STABILITY/SHOCK)

Brand New
Used
Depleted

either Class D

INFO

- STORAGE: CMC 281402Z MAR 83
- PACKAGING: CMC 281402Z MAR 83
  CMC 301405Z MAR 83
  CMC 111402Z APR 83
  CMC 111403Z APR 83
- GENERAL: CG FMFLANT 301902Z JUN 83
  CG FMFLANT 071358Z SEP 83
  CG FMFPAC 281951Z SEP 83

LITHIUM BATTERIES

TRANSPORT PROBLEMS

- MODE:
  - AIR (DOT E-7052)
  - SEA (NAVSEAINST 9310.1_)
  - LAND (DOT E-8441)
- BATTERY STATUS:
  - NEW
  - USED
  - DEPLETED

INFO

- AIR: HQ AFLC WPAFB OH 031215Z FEB 83
  CMC 111402Z APR 83
  CMC 111403Z APR 83
- SEA: COMNAVSEASYSCOM 04H32/HTH, 491-8020, 25MAY82
- GENERAL: CG FMFLANT 301902Z JUN 83
  CG FMFLANT 071358Z SEP 83
  CG FMFPAC 281951Z SEP 83

LITHIUM BATTERIES

DISPOSAL PROBLEMS

- DPDS POLICY:
  - BALANCED vs UNBALANCED
  - CONFORMING OR "MOST-NEARLY" CONFORMING STORAGE
  - BATTERY IDENTIFICATION / CERTIFICATION
  - "SAFE" TO HANDLE
- INTERNAL PROCEDURES:
  - PACKAGING
  - STORAGE
  - RESPONSIBILITIES

MCBul
6280
17 MAY

INFO

DPDS 101349Z FEB 83
CMC 071402Z MAR 83
CMC 281402Z MAR 83
CMC 221405Z APR 83
CG FMFLANT 071358Z SEP 83
CG FMFPAC 281951Z SEP 83

LITHIUM BATTERIES

OPNL USE PROBLEMS

- EXERCISES W/O GROUND TRANSPORT SUPPORT
- SUBMARINES (RECON OPS)
- ALTERNATIVE POWER SOURCES

INFO

CMC 101402Z MAR 83
CMC 111403Z APR 83
CG FMFLANT 301902Z JUN 83
CG FMFLANT 071358Z SEP 83
CG FMFPAC 281951Z SEP 83
CG FMFLANT 271818Z SEP 83
CMC 281402Z SEP 83
CMC 141405Z OCT 83 / 251405Z OCT 83

LITHIUM BATTERIES

INCIDENTS

- IN STORAGE
  - SYMPTOMS (LEAKAGE, BULGING CASE, ODOR)
  - PROBABLE CAUSE (HUMIDITY INDUCED CORROSION)
- IN OPERATION
  - AN/PRC-104 (CY-7875)
  - KY-57 (ZAIJ)
  - TOW-II NIGHT SIGHT BATTERY POWER CONDITIONER

ACTIONS

- USMC (REMOVAL FROM SERVICE, BATTERY CASE VENTS)
- USAR ERADCOM (INVESTIGATE CAUSES)
- USAR CECOM (BATTERY REPLACEMENT)

INFO

CMC 091403Z JUN 83
CMC 071403Z NOV 83
CMC 141405Z OCT 83 / 251405Z OCT 83

ARLINGTON ANNEX
MESSAGE CENTER

PRIORITY/ROUTINE ZYUW RUEACMC1692 3112133
P R 071403Z NOV 83
FM CMC WASHINGTON DC
TO CG FMFLANT CG FMFPAC
CG LFTCLANT NORFOLK VA CG FOURTH FSSG
MCCES TWENTYNINE PALMS CA AIG EIGHT
INFO CDRCECOM FT MONMOUTH NJ //DRSEL-MMG-B/DRSEL-SF-ME/ E/
DRSEL-PC-C-TM/DRSEL-PA-QP-B//
CDRERADCOM FT MONMOUTH NJ //DELET-PB//
CDRERADCOM ADELPHI MD //DRDEL-SS//
XMT CG MCRD ERR PARRIS ISLAND SC CG MCRD WRR SAN DIEGO CA
HQBN HQMC ARLINGTON VA MARBKS WASHINGTON DC
FIRST MCD GARDEN CITY LI NY MARFINCEN KANSAS CITY MO

UNCLAS //N04000//
SUBJ: SAFETY OF USE MESSAGE, ADVISORY, TECHNICAL, BATTERY BA-5590, NSN 6135-01-036-3495, CONTRACT DAAB07-81-D-6527 (PCI)
NOTE: THIS IS SAFETY ADVISORY MESSAGE THAT HAS NOT, REPEAT HAS NOT BEEN TANSMITTED TO UNITS SUBORDINATE TO ADDRESSEES. ADDRESSEES SHOULD IMMEDIATELY RETRANSMIT THIS MESSAGE TO ALL SUBORDINATE UNITS. ACTIVITES OR ELEMENTS AFFECTED OR CONCERNED.
A. CMC WASHINGTON DC 091403Z JUN 83
B. CMC WASHINGTON DC 011405Z AUG 83
C. CMC WASHINGTON DC 121402Z OCT 83
D. CMC WASHINGTON DC 131403Z OCT 83
E. CMC WASHINGTON DC 141403Z OCT 83
F. CMC WASHINGTON DC 181402Z OCT 83
G. CMC WASHINGTON DC 011403Z NOV 83
1. TAKE FOLLOWING ACTION IMMEDIATELY:
A. ADD LOT 0183, REPEAT 0183, OF CONTR DAAB07-81-D-6527 TO LOTS IDENT AS POTENTIALLY DEFECTIVE BY THE REFS.
B. COMPLY WITH REF A REMOVAL FROM GENERAL SERVICE, DISPOSAL OR STORAGE, SAFETY, HANDLING, INVENTORY, PACKAGING AND REPORTING INSTRUCTIONS FOR ADDED LOT (0183, CONTR DAAB07-81-D-6527).
2. REQUEST REPORTS ON ABOVE LOT BE SUBMITTED ASAP AND NLT 25 NOV 83. INFO IS REQUIRED TO ASSIST IN ARMY/MFR NEGOTIATIONS.
3. FOLLOWING IS A RECAP OF BA-5590 BATTERY MFR LOTS WHICH HAVE BEEN REMOVED FROM GENERAL SERVICE BY THE REFS AND THIS MSG:

CONTR	MFR LOT/DATE	REF
DAAB07-80-D-6502 (MALLORY)	1080	A
	1180	A
	1280	A
DAAB07-80-D-6504 (PCI)	1081	G
	1281	E
DAAB07-81-D-6526 (DURACELL)	1181	A
	1281	F
	0182	C
	0282	A
	0382	A
	0482	B
DAAB07-81-D-6527 (PCI)	0982	D
	1082	D
	1182	F
	0183	THIS MSG

4. HQMC POC IS LTCOL W. N. LOWE, LMA-3, (A) 224-2039. BT

CMC WASH DC 8
ACTION L(5) (D,6)
INFO CC(1) POC(1) TFK CK(1)

MCN=83311/20886 TOR=83311/2132Z TAD=83311/2137Z CDSN=MAB504

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE ZYUW RUEACMC7801 3002203
R 251405Z OCT 83
FM CMC WASHINGTON DC
TO CG FMFLANT
INFO CG FMFPAC CGMCDEC QUANTICO VA
CG MCLB ALBANY GA
CDRCECOM FT MONMOUTH NJ//DRSEL-MMG-B/DRSEL-SF-ME/
DRSEL-PC-C-TM//
CDRERADCOM FT MONMOUTH NJ//DELET-PB//
CDRERADCOM ADELPHI MD //DRDEL-SS//
TWO FOUR MAU
DIRNSA FT GEORGE G MEADE MD //S82//

UNCLAS //N04400//
FOR G4, CEO, INFO: A800
SUBJ: LITHIUM BATTERY INCIDENTS
A. CMC WASHINGTON DC 141405Z OCT 83 (NOTAL)
1. PARA 4. OF THE REF DISCUSSES RECENT INCIDENTS AND LOCALLY DEVISED OPERATOR PROTECTION METHODS (I.E. SANDBAGGING OF OPERATING EQUIP).
2. LOCALLY DEVISED METHODS ARE NOT, REPEAT NOT, TO INCLUDE MODIFICATION OF ZAIJ OR CY-7875 BATTERY CONTAINERS. WE ARE COORDINATING WITH BATTERY CONTAINER DEVELOPERS/MANUFACTURERS TO DEVELOP APPROPRIATE MODIFICATION KITS AND INSTRUCTIONS. DETAILED INFO ON KITS/INSTR AND AUTH TO IMPLEMENT MOD(S) WILL BE DISSIMINATED WHEN AVAIL.
3. CMC POC IS LTCOL W. N. LOWE, LMA-3, AV 224-2039. BT

CMC WASH DC
ACTION L(5) (D,6) 7
INFO POC(1) TFK CK(1)

MCN=83300/28966 TOR=83300/2203Z TAD=83300/2203Z CDSN=MAB020

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE ZYUW RUEACMC4278 2902030
R 141405Z OCT 83
FM CMC WASHINGTON DC
TO CG FMFLANT
INFO CG FMFPAC CGMCDEC QUANTICO VA
CG MCLB ALBANY GA
CDRCECOM FT MONMOUTH NJ //DRSEL-MMG-B/DRSEL-SF-ME/
DRSEL-PC-C-TM//
CDRERADCOM FT MONMOUTH NJ //DELET-PB//
CDRERADCOM ADELPHI MD //DRDEL-SS//
TWO FOUR MAU

UNCLAS //N04400//
FOR: G4, CEO, INFO: A800
SUBJ: LITHIUM BATTERY INCIDENTS
A. CG SECOND MARDIV 121500Z OCT 83 (NOTAL)
B. TWO FOUR MAU 131313Z OCT 83 (NOTAL)
C. SECOND TKBN 111500Z OCT 83 (NOTAL)
1. WE VIEW WITH EXTREME CONCERN THE RECENT BA-5590 LITHIUM BATTERY INCIDENTS REPORTED BY THE REFS. THE INCIDENTS, AS REPORTED, INDICATE THAT WE ARE FACED WITH A PROBLEM SIGNIFICANTLY GREATER THAN THAT PREVIOUSLY IDENTIFIED. THE US ARMY'S ERADCOM IS EXPENDING MAXIMUM EFFORT TOWARDS DETERMINING THE CAUSE(S) OF THE INCIDENTS/DEFECTS AND DURACELL HAS INDICATED A DEGREE OF WILLINGNESS TO REPLACE THE BATTERIES WHICH WE HAVE PREVIOUSLY REPORTED AS DEFECTIVE. HOWEVER, ERADCOM'S ABILITY TO INVESTIGATE SUCH INCIDENTS AS THOSE REPORTED BY THE REFS IS HAMPERED BY OUR INABILITY TO PROVIDE RESIDUE TO THEM OM A TIMELY BASIS AND THEIR INABILITY, TO DATE, TO "CREATE" LIKE PROBLEMS IN A LAB ATMOSPHERE. WE, ERADCOM, AND THE BATTERY MANUFACTURERS WILL CONTINUE OUR EFFORTS TO DISCOVER BATTERY DEFECT CAUSES AND DEVISE METHODS TO ENHANCE BATTERY SAFETY/STABILITY FACTORS.
2. IN THE INTERIM, WE WILL CONTINUE TO REMOVE MFR LOTS FROM GENERAL SERVICE WHENEVER REPORTED INCIDENTS INDICATE THAT OTHER BATTERIES FROM A GIVEN LOT MAY HAVE BEEN SUBJECTED TO LIKE CIRCUMSTANCES (I.E. MANUF PROCESS, TRANSPORT, STORAGE, ETC.) AND SHOULD BE AFFORDED ADDITIONAL PROTECTION/CARE. WE REGRET THE IMPOSITION OF ANY ADDITIONAL WORKLOAD INVOLVED IN THE INVENTORY, STORAGE AND REPORTING PROCESS. HOWEVER, LOCAL HOLDER DEVELOPMENT OF RUNNING INVENTORIES (BY CONTR, MANUF DATE/LOT, AND BTRY SER NO.) AND STORAGE OF BATTERIES IN CONTR/LOT SEQUENCE SHOULD MINIMIZE THESE DIFFICULTIES.
3. IT IS REITERATED THAT THE BA-5590'S REMOVED FROM GENERAL SERVICE MAY BE UTILIZED TO MEET CRITICAL OPERATIONAL REQUIREMENTS. SUCH BATTERIES SHOULD BE CAREFULLY INSPECTED PRIOR TO USE, BE HANDLED WITH CARE AND OPERATOR PERSONNEL MADE AWARE OF THEIR STATUS.
4. WHEN THE OPNL SECNARIO PERMITS, EVERY EFFORT MUST BE MADE TO USE THE ALTERNATE BATTERY(BB-590) PRIOR TO UTILIZING THE BA-5590, ESPECIALLY WHEN THE EQUIP AND OPERATOR ARE TO BE IN DIRECT PROXIMITY. WE ARE TAKING ACTION TO ALLEVIATE FMFLANT DEPLOYED-UNIT BATTERY RECHARGE DIFFICULTIES IN THE NEAR FUTURE (TO BE DISCUSSED BY SEP CORRESP). IN THOSE CASES WHEREIN BA-5590'S MUST BE USED, THE CAUTIONS NOTED IN PARA 3. ABOVE APPLY. FURTHER, LOCALLY DEVELOPED METHODS OF PROVIDING ADDITIONAL PROTECTION TO PERSONNEL IN PROXIMITY TO THE BATTERIES (I.E. SANDBAGGING AROUND EQUIP) IS ENCOURAGED. IT SHOULD BE NOTED, HOWEVER, THAT THE INCIDENTS REPORTED TO DATE INDICATE THAT THE BATTERIES VENTED PROPERLY, BUT THE KY-57 AND PRC-104 BATTERY CASES DID NOT ALLOW RAPID DISSIPATION OF THE VENTED GASSES, THUS THE CASES THEMSELVES BECAME AN INTEGRAL PART OF THE HAZARD. ACCORDINGLY, LOCALLY DEVISED PROTECTION METHODS/MATERIELS SHOULD BE SO DESIGNED AS TO ALLOW RAPID DISSIPATION OF ANY VENTED GASSES
5. HQMC POC IS LTCOL W. N. LOWE (CODE LMA-3) (AV) 224-2039. BT

See CMC 251405Z Oct 83

CMC WASH DC 7
ACTION L(5) (D,6)
INFO POC(1) TFK CK(1)

MCN=83290/18583 TOR=83290/2030Z TAD=83290/2030Z CDSN=MAC572

UNCLASSIFIED

ROUTINE ZYUW RUHQSGG3147 2721037
R 2819517 SEP 83
FM CG FMFPAC
TO AIG ONE FIVE ONE AIG ONE FOUR FIVE
AIG ONE FOUR FOUR
INFO CMC WASHINGTON DC CG FMFLANT

UNCLAS//N02900//THIS IS A CG FMFPAC/COMMARCORBASESPAC MSG
SECTION 01 OF 02 //N02900//
CMC FOR CODE LMA-3; OTHERS FOR CEO
SUBJ: LITHIUM BATTERIES
A. CMC WASHINGTON DC 281402Z MAR 83 PASEP
B. CMC WASHINGTON DC 301405Z MAR 83 PASEP
C. COMNAVSEASYSCOM LTR 04H32/HTH/SER 491 8020 OF 25MAY82 PASEP
D. DOT-E 7052 (11TH REVISION) PASEP
E. DOT-E 8441 PASEP
F. CMC WASHINGTON DC 111402Z MAR 83 PASEP
G. CMC WASHINGTON DC 111403Z APR 83 PASEP
H. CMC WASHINGTON DC 081403Z MAR 83 PASEP
I. CMC WASHINGTON DC 241402Z JAN 83 PASEP
J. CG FMFPAC 201934Z APR 83 PASEP
K. NAVSEAINST 9310.1A PASEP
1. SINCE THEIR INTRODUCTION INTO THE MARINE CORPS INVENTORY, THE LITHIUM SULFUR-DIOXIDE (LI-SO2) BATTERY HAS BEEN THE SUBJECT OF EXTENSIVE CORRESPONDENCE. IN A ATTEMDT TO MINIMIZE THE CONFUSION ASSOCIATED WITH THE (LI-SO2) BATTERY, THIS MSG IS PROVIDED AS AN INTERIM SINGLE SOURCE DOCUMENT FOR HANDLING, STORAGE AND DISPOSAL OF THESE BATTERIES PENDING PUBLICATION OF MCO ON SUBJECT.

A. STORAGE AND HANDLING ASHORE. REFS A AND B PERTAIN.

(1) BATTERIES SHALL BE STORED IN ORIGINAL OR SIMILAR PACKAGING IN A COOL VENTILATED SHELTER (SPRINKLER PROTECTED IF FEASIBLE).

(2) TEMPS EXCEEDING 130 DEGREES SHOULD BE AVOIDED.

(3) ALL BATTERY STORAGE AREAS SHALL BE EQUIPPED WITH A CLASS "D" EXTINGUISHER.

(4) NO OTHER MATERIAL OR COMMODITY WILL BE STORED IN THE SAME STACK WITH THE BATTERIES.

45) SMOKING IS STRICTLY PROHIBITED IN BATTERY STORAGE AREAS.

(6) QTY OF EXPENDED BATTERIES WILL BE TURNED INTO DPDO AT LEAST EVERY 30 DAYS OR UPON ACCUMULATION OF 30 LBS WHICHEVER OCCURS FIRST

B. STORAGE AND HDLG ABOARD SURFACE SHIPS. REFS C & K PERTAIN.

(1) NEW BATTERIES MAY BE STORED EITHER ON WEATHER DECKS OR BELOW DECKS.

(2) QUANTITY WILL BE KEPT TO A REASONABLE MINIMUM.

(3) WEATHER DECK STORAGE WILL BE IN JETTISONABLE DRIP PROOF LOCKERS.

(4) BELOW DECK STORAGE SHOULD BE IN COOL, SPRINKLER PROTECTED, VENTILATED AREA. ISOLATED BY UTILIZING EQUIVALENT BARRIERS TO THOSE USED TO SEPARATE STOWS OF LFORM AMMO.

(5) USED BATTERIES WILL BE STORED ON WEATHER DECK ONLY.

(6) EQUIPMENTS WITH LITHIUM BATTERIES INSTALLED NOT ALLOWED IN BERTHING SPACES.

(7) BATTERIES SHOULD BE OFF LOADED AT EARLIEST POSSIBLE TIME BUT NOT DURING AMMUNITION OR REFUELING EVOLUTIONS.

C. TRANSPORTATION OF LITHIUM BATTERIES. THERE ARE NUMEROUS REGULATIONS WHICH AUTHORIZE/RESTRICT TRANSDORTATION OF LITHIUM BATTERIES VIA DIFFERENT MODES. THE FOLLOWING IS A SUMMATION OF THOSE REGULATIONS. READ IN TWO COLUMNS.

TRANS MODE	APPLICABLE REF/REFS
AMPHIB SHIPPING	C, K
SUBMARINE	C
COMM AIR	D, E
MOTOR FREIGHT	D, E
MILITARY TACTICAL VEHICLE	D, E
COMM SHIPPING	D, E
RAIL	D, E
MAC AIR	F, G, H
USMC AIR	G, I, J

D. SAFETY IN HANDLING LITHIUM BATTERIES.

(1) A LITHIUM BATTERY IS A HIGH ENERGY ELECTRIC POWER SOURCE CONSISTING OF 10 HERMETICALLY SEALED STAINLESS STEEL CASED CELLS. EACH CELL CONTAINS LITHIUM METAL, SULFUR DIOXIDE (SO2) GAS, AND ORGANIC SOLVENTS UNDER PRESSURE (30 TO 60 POUNDS PER SQUARE INCH ATMOSPHERIC (PSIA).) THE CONTENTS ARE POTENTIALLY FLAMMABLE AND/OR NOXIOUS.

(2) THE LITHIUM BATTERY IS PROTECTED BY A 3.2 AMPERE SLOW BLOW REPLACEABLE FUSE IN EACH 12-VOLT SECTION TO PROTECT AGAINST EXCESSIVE CURRENTS OR EXTERNAL SHORT CIRCUITS WHICH COULD LEAD TO OVERHEATING, CELL VENTING, OR CELL RUPTURE. THIS FUSE WILL NOT BE BYPASSED OR REPLACED WITH A HIGHER RATED FUSE.

(3) EACH CELL INCORPORATES A VENTING DEVICE WHICH RELEASES INTERNAL PRESSURE TO AMBIENT PRESSURE IF THE INTERNAL PRESSURE EXCEEDS 350 TO 450 PSIA (NORMALLY CAUSED BY OVERHEATING (200, TO 222 DEGREES F)), IN ORDER TO PREVENT THE CELL FROM RUPTURING. IF A CELL VENTS, SULFUR DIOXIDE GAS, A NOXIOUS EYE AND RESPIPRATORY IRRITANT, WILL BE RELEASED. IRRITATION WILL OCCUR LONG BEFORE TOXIC CONCENTRATIONS ARE REACHED.

(4) THE LITHIUM BATTERY CONTAINS PRESSURIZED CELLS SIMILIAR TO AEROSOL CANS; THEREFORE, UNDER NO CIRCUMSTANCES SHOULD THE BATTERY BE DELIBERATELY OPENED, CRUSHED, PUNCTURED, DISASSEMBLED OR OTHERWISE MUTILATED IN ANY WAY WHICH COULD RESULT IN A POSSIBLE CELL RUPTURE.

(5) LITHIUM BATTERIES SHOULD BE NOT BE HEATED. OVERHEATING MAY PRODUCE INTERNAL PRESSURE AT A RATE IN EXCESS OF THE VENTING CAPACITY AND COULD RESULT IN A CELL OR BATTERY RUPTURE.

(6) UNDER NO CIRCUMSTANCES SHOULD RECHARGING OF THE BATTERIES BE ATTEMPTED, AS SUCH ACTION COULD LEAD TO VENTING, RUPTURE, OR RUPTURING WITH FIRE.

(7) A THERMAL CURRENT INTERRUPTER IS BEING INCORPORATED INTO LITHIUM BATTERIES TO SHUT DOWN BATTERY OPERATION IF THE INTERNAL TEMP EXCEEDS 191 DEGREES F.

(8) THE LITHIUM METAL RESIDENT IN LITHIUM BATTERIES WILL BURN WHEN EXPOSED TO AIR AND CAN NOT BE EXTINGUISHED BY WATER IF THE QUANTITY OF LITHIUM EXPOSED IS SIGNIFICANT; I.E., IF MANY CELLS ARE VENTED AND OPENED. LITHIUM FIRES ARE EXTINGUISHABLE WITH A CLASS D FIRE EXTINGUISHER. IF NOT AVAIL, DRY CHEMICAL EXTINGUISHERS OR BURIAL IN DRY SAND WILL EXTINGUISH THE FIRE. CARBON DIOXIDE EXTINGUISHERS HAVE BEEN FOUND TO BE INEFFECTIVE IN LITHIUM FIRES AND ARE NOT RECOMMENDED AS THEY ARE POTENTIALLY HAZARDOUS. A FINE SPRAY OF WATER IN SUFFICIENT AMOUNTS SO AS TO FLOOD THE BURNING MATERIALS MAY BE USEFUL. THIS WILL NOT ONLY TEND TO CUT OFF AIR ACCESS TO THE FIRE BUT WILL COOL DOWN THE BATTERIES AND SURROUNDING COMBUSTIBLES SO THAT FURTHER CELL VENTING AND BURNING ARE MINIMIZED. IN ANY EVENT, EFFORTS SHOULD BE AIMED AT PREVENTING THE SPREAD OF THE FIRE TO OTHER COMBUSTIBLES.

(9) AIR RESPIRATORS OR SELF-CONTAINED BREATHING APPARATUS APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND BT

(continued on reverse)

CMC WASH DC 12
COG L-S(11) (M,C)
INFO TFK CK-S(1)

ROUTINE ZYUW RUHQSGG3148 2721037
R 281951Z SEP 83
FM CG FMFPAC
TO AIG ONE FIVE ONE AIG ONE FOUR FIVE
AIG ONE FOUR FOUR
INFO CMC WASHINGTON DC CG FMFLANT

UNCLAS
FINAL SECTION OF 02 //NO2900//
HEALTH (NIOSH) SHALL BE WORN WHEN ENTERING STORAGE SPACES WHERE LITHIUM BATTERIS ARE VENTING OR HAVE VENTED.
E. THE FOLLOWING PROCEDURES SHOULD BE OBSERVED WHEN LITHIUM BATTERIES ARE USED.

(1) PRIOR TO ANY HANDLING/USAGE, LITHIUM BATTERIES SHOULD BE VISUALLY INSPECTED FOR ANY INDICATION OF DETERIORATION, MOISTURE WITHIN OR INFLATION OF THE PLASTIC WRAP/BAG, OR PUNGENT ODOR. DO NOT USE THE BATTERY IF ANY OF THESE CONDITIONS EXIST.

(2) BATTERIES ARE TO BE OPENED CAREFULLY IN A WELL VENTILATED AREA AND ARE TO BE HELD AWAY FROM THE FACE WHEN REMOVING THE PLASTIC BAG/WRAP.

(3) AFTER BATTERY INSTALLATION, IF AN OPERATOR DETECTS THE BATTERY COMPARTMENT BECOMING HOT, HEARS CELLS VENTING (HISSING SOUND), OR SMELLS THE IRRITATING PUNGENT GAS, THE FOLLOWING IMMEDIATE ACTIONS WILL BE PERFORMED:

(A) TURN OFF THE EQUIPMENT.

(B) MOVE PERSONNEL OUT OF THE IMMEDIATE AREA

(C) ALLOW ONE HOUR FOR THE BATTERY TO COOL. IF THE BATTERY IS NOT COOL TO THE TOUCH MORE TIME WILL BE NECESSARY.

(D) WHEN THE BATTERY IS COOL TO THE TOUCH, CAREFULLY REMOVE IT FROM THE EQUIPMENT, (USE OF GLOVES AND PROTECTIVE MASK IS RECOMMENDED).

(E) PACKAGE THE FAULTY BATTERY IN A PLASTIC BAG (SEALING THE BAG WITH TAPE) AND RETURN TO ORIGINAL FIBERBOARD SHIPPING CONTAINER OR EQUIVALANT PROTECTION. IF THE BATTERY CANNOT BE REMOVED FROM THE EQUIP, PROVIDE LIKE PACKAGING/PROTECTION FOR THE EQUIPMENT.

(F) SEGREGATE THE BATTERY/EQUIP TO PREVENT UNDUE HANDLING OR HAZARD TO PERSONNEL AND REPORT THE INCIDENT/CIRCUMSTANCES AS INDICATED IN FOLLOWING PARA.

F. LITHIUM BATTERY INCIDENT REPORTS. A REPORT WILL BE SUBMITTED TO THE OPERATIONAL COMMANDER WITH INFO COPIES TO CG FMFPAC (CEO) CG FMFLANT (CEO), AND CMC (CODE LMA-3) WHENEVER A LEAKAGE, VENTING, OR RUPTURE OF A LITHIUM BATTERY OR CELL IS DISCOVERED/OCCURS. THE FOLLOWING DETAILS WILL BE PROVIDED AS A MINIMUM:

(1) TYPE OF BATTERY INVOLVED
(2) MANUFACTURER (MFR) OF BATTERY.
(3) CONTRACT LOT NUMBER.
(4) MFR DATE.
(5) BATTERY SERIAL NUMBER.
(6) CIRCUMSTANCES.
(7) PRESENT LOCATION/DISPOSITION OF THE BATTERY.
(8) POINT OF CONTACT FOR ADDITIONAL INFORMATION.

G. CUSTODY OF LITHIUM BATTERIES. POSITIVE PROCEDURES WILL BE ESTABLISHED TO ENSURE THAT THE FOLLOWING TYPES OF EVENTS CANNOT OCCUR.

(1) USED LITHIUM BATTERIES BEING REMOVED FROM THE WORKING AREA INTO RESIDENTIAL AREAS.

(2) USED LITHIUM BATTERIES BEING IMPROPERLY DISCARDED IN THE FIELD.

(3) USED LITHIUM BATTERIES REMAINING IN THE WORKING AREAS INSTEAD OF BEING TURNED INTO SUPPLY FOR DISPOSAL.

H. STORAGE OF NEW BATTERIES IN A FIELD ENVIRONMENT. THE PROVISIONS OF PARA 1.A ABOVE APPLY.

I. STORAGE OF USED LITHIUM BATTERIES IN GARRISON. THE PROVISIONS OF PARA 1.A SHALL BE FOLLOWED WITH THE FOLLOWING EXCEPTIONS:

(1) USED/DEPLETED LITHIUM BATTERIES ARE TO BE SEGREGATED FROM NEW LITHIUM BATTERIES.

(2) USED BATTERIES SHALL BE INDIVIDUALLY SEALED IN A PLASTIC BAG OR WRAPPED IN ELECTRIC INSULATING TAPE. THEY WILL BE STORED IN A WOODEN BOX OR FIBERBOARD CONTAINER OF THE SAME OR GREATER CONSTRUCTION AS THE ORIGINAL SHIPPING CONTAINERS (RECOMMEND SAVING THE ORIGINAL CONTAINERS FOR THIS PURPOSE).

2. DISPOSAL OF LITHIUM BATTERIES. USED/DEPLETED LITHIUM BATTERIES WILL NOT BE STORED IN EXCESS OF THIRTY DAYS NOR SHOULD TOTAL QTY WEIGHT EXCEED THIRTY POUNDS WHILE AWAITING DISPOSAL IAW REF A. THE MEANS OF DISPOSING OF USED/DEPLETED LITHIUM BATTERIES WILL BE DISCUSSED IN THIS PARAGRAPH. ACCOUNTABILITY OR DOCUMENTATION PROCEDURES WILL BE IAW STANDARD SUPPLY PROCEDURES.

A. DISPOSAL WITHIN CONUS. USED/DEPLETED LITHIUM BATTERIES WILL BE TURNED IN TO THE NEAREST DEFENSE PROPERTY DISPOSAL OFFICE (DPDO) ACTIVITY. THE BATTERIES MUST BE PROPERLY IDENTIFIED, BE PROPERLY PACKAGED, BE OF BALANCED CELL DESIGN AND CERTIFIED AS SUCH.

B. DISPOSAL AT SEA. IAW REF K, USED/DEPLETED LITHIUM BATTERIES MAY BE DISPOSED OF AT SEA PROVIDING THE VESSEL IS OVER 50 MILES FROM SHORE AND THE DEPTH OF THE WATER IS IN EXCESS OF 500 FEET. REF K FURTHER STATES THAT BATTERIES WILL NOT BE STORED ABOARD SHIP FOR DISPOSAL ASHORE.

C. DISPOSAL GUIDELINES OUTSIDE OF CONUS.

(1) DISPOSAL IAW HOST NATION SUPPORT AGREEMENTS IS THE PREFERRED METHOD.

(2) THE NEXT PREFERRED METHOD IS TO TURN THE BATTERIES INTO A LOCAL DPDO ACTIVITY IF POSSIBLE.

(3) BATTERIES SHOULD BE RETROGRADED TO AMPHIBIOUS SHIPPING FOR DISPOSAL AT SEA IF THE ABOVE LISTED METHODS ARE NOT POSSIBLE.

(4) UNITS BEING DEPLOYED/REDEPLOYED BY MAC AIRLIFT SHOULD USE AN ALTERNATE POWER SOURCE (I.E. BB 590) IF POSSIBLE, WHEN HOST NATION DISPOSAL, A DPDO ACTIVITY OR AMPHIBIOUS SHIPPING ARE UNAVAILABLE TO DISPOSE OF USED LITHIUM BATTERIES. HOWEVER, IF LITHIUM BATTERIES MUST BE USED THE FOLLOWING METHOD OF DISPOSAL MAY BE UTILIZED ONLY AS A LAST RESORT:

(A) DISPOSAL WILL BE ACCOMPLISHED BY BURNING. A PIT TWO FEET DEEP AND OF SUFFICIENT SIZE TO PLACE A USED AMMO CAN IN WILL BE USED. THE AMMO CAN SHOULD BE FILLED WITH HEAT TABS TO BURN THE BATTERIES. A SMALL GRILL OVER THE AMMO CAN TO EXPEDITE BURNING IS RECOMMENDED. ONCE BURNING IS COMPLETE THE BATTERY REMAINS SHOULD BE BURIED IN THE PIT.

(B) SAFETY CONSIDERATIONS. PERSONNEL BURNING THE BATTERIES SHOULD WEAR PROTECTIVE MASK AND REMAIN UPWIND. BURNING SHOULD TAKE PLACE IN AN ISOLATED AREA AWAY FROM PEOPLE.

3. REQ WIDEST DISSEMINATION OF THE CONTENTS OF THIS MSG TO ALL PERSONNEL CONCERNED. RETAIN THIS MSG IN TURNOVER FILES OF MMO, COMMO AND SAFETY O.
4. POC THIS HQ: FMFPAC CEO MGSGT ROYAL AVN/COM 477-5010/5011. BT

CMC WASH DC
COG L-S(11)
INFO TFK CK-S(1)

12

(M,C)

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE ZYUW RUEACMC9058 2722339
R 281402Z SEP 83
FM CMC WASHINGTON DC
TO CG FMFPAC
CG FOURTH FSSG
MARBKS GUANTANAMO BAY CUBA
CG LFTCLANT NORFOLK VA
MCCES TWENTYNINE PALMS CA
AIG EIGHT
INFO CG FMFLANT
XMT CG MCRDERR PARRIS ISLAND SC
HQBN HQMC ARLINGTON VA
FIRST MCD GARDEN CITY LI NY
CG MCRD SAN DIEGO CA
MARBKS WASHINGTON DC
MARFINCEN KANSAS CITY MO

UNCLAS //N0440U//
SUBJ: LITHIUM BATTERIES, BA-5590 (CMC CODE LMA-3)
A. CMC WASHINGTON DC 091403Z JUN 83
B. CMC WASHINGTON DC 011405Z AUG 83
C. CG FMFLANT 271818Z SEP 83 (PASEP)
1. REFS A AND B DIRECTED THE INVENTORY AND REMOVAL FROM SERVICE OF BA-5590 LITHIUM BATTERIES FROM CONTRACTS DAAB07-80-D-6502 (MFR DATES 1080, 1180 AND 1280) AND DAAB07-81-D-6526 (MFR DATES 1181, 0282, 0382 AND 0482). BATTERIES FROM THESE CONTRACT/MFR DATES WERE TO BE DISPOSED OF IF VISUAL DEFECTS WERE PRESENT OR PLACED IN PROTECTED STORAGE IF NO VISUAL DEFECTS WERE NOTED.
2. REF C, TRANSMITTED WITH THE CONCURRENCE OF THIS HQ, AUTH II MAF USE OF BATTERIES PLACED IN PROTECTED STORAGE UNDER CERTAIN CIRCUMSTANCES.
3. AUTH GRANTED FOR MARCOR-WIDE USE OF SUCH BATTERIES (NO VISUAL DEFECTS), SUBJECT TO THE RESTRICTIONS/DIRECTIONS NOTED BY REF C. BT

CMC WASH DC
ACTION L(5)
INFO POC(1) TFK CK(1)

(D,6)

7

MCN=83272/31450 TOR=83272/2314Z TAD=83272/2339Z CDSN=MAB895

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE
R 281403Z SEP 83
FM CMC WASHINGTON DC
INFO CG FMFLANT
CG LFTCLANT NORFOLK VA
MCCES TWENTYNINE PALMS CA
AIG EIGHT
XMT CG MCRD ERR PARRIS ISLAND SC
HQBN HQMC ARLINGTON VA
FIRST MCD GARDEN CITY LI NY

ZYUW RUEACMC1116 2722337

CG FMFPAC
CG FOURTH FSSG
MARBKS GUANTANAMO BAY CUBA

CG MCRD SAN DIEGO CA
MARBKS WASHINGTON DC
MARFINCEN KANSAS CITY MO

P 271818Z SEP 83
FM CG FMFLANT
TO CG SECOND FSSG
CG SECOND MAW
INFO CMC WASHINGTON DC

CG SECOND MARDIV
MSSG TWO FOUR

See CMC 281402Z Sep 83

UNCLAS //N04400//
FR: 21C FOR: SMU/MBH/GA, CSS SUPSPT, DSO, SC-221, SUPO, CEO INFO: LMA-3
SUBJ: LITHIUM BATTIERIES, BA 5590
A. CG SECOND FSSG 211320Z SEP 83
B. CMC WASHINGTON DC 091403Z JUN 83 NOTAL
C. FONECON BTWN MAJ SHIRK (FMFLANT) AND LTCOL LOWE (CMC, LMA-3) OF 26 SEP 83
1. REF A REQ AUTH TO USE SUBJ BATTERIES FR SUSPECT LOTS WHICH ARE BEING HELD IN PROTECTED STORAGE AS PRESCRIBED BY REF B.
2. IAW REF C BATTERIES IN COND CODE E (NO VISIBLE DEFECTS) MAY BE USED WHERE A LITHIUM BATTERY IS CONSIDERED ESSENTIAL. THIS SHOULD NOT INCLUDE ROUTINE TRAINING OR OPERATIONS LHERE NON-LITHIUM BATTERIES ARE A FEASIBLE ALTERNATIVE.
3. BATTERIES MUST BE REINSPECTED BEFORE ISSUE TO ENSURE THAT NO DEFECTS ARE APPARENT. IF DEFECTS ARE PRESENT IN BATTERIES PREVIOUSLY IDENTIFIED AS COND CODE E REVISED COND CODE AND QTY SHOULD BE REPORTED TO CMC (LMA-3) IAW PAR 4.C. OF REF B.
4. WHILE BATTERIES FROM SUSPECT LOTS MAY DISPLAY NO OUTWARD DEFECT THEY MAY HAVE BEEN SUBJECTED TO THE SAME MANUFACTURING DISCREPANCIES AS THOSE WITH VISIBLE DEFECTS. PERSONNEL INSPECTING, HANDLING AND USING THESE BATTERIES SHOULD EXERCISE DUE CARE AND CAUTION AND ADHERE TO PROCEDURES IN REF B. BT

PRIORITY
P 282017Z SEP 83
FM CG FMFLANT
TO CG SECOND FSSG
INFO CMC WASHINGTON DC
CG SECOND MAW

ZYUW RHCJSGG3846 2711545

CG SECOND MARDIV

UNCLAS //N04400//
FR: 21C FOR: CSS SUPSPT SMU/MBH/GA INFO: LMA-3, DSO, WSO
SUBJ: LITHIUM BATTERIES, BA 5590
A. CG FMFLANT 271818Z SEP 83
B. CG SECOND FSSG 132155Z SEP 83 NOTAL
1. REF A AUTH ISSUE OF SUBJ BATTERIES FROM SUSPECT LOTS FOR USE IN OTHER THAN ROUTINE TRAINING AND OPS.
2. TO AMPLIFY REF A, ISSUE OF LITHIUM BATTERIES IS CONSIDERED APPROPRIATE FOR ALL REQUIREMENTS IN PAR 2 OF REF B EXCEPT FOR THOSE EVENTS WHICH WILL TAKE PLACE ENTIRELY IN CONUS. BT

CMC WASH DC
ACTION L(5)
INFO POC(1) TFK CK(1)

7

(D,6)

MCN=83272/31430 TOR=83272/2314Z TAD=83272/2338Z CDSN=MAX998

PRIORITY ZYUW RHCJSGG5679 2501125
P 071358Z SEP 83
FM CG FMFLANT
TO FMFLANT
INFO CMC WASHINGTON DC CG FMFPAC

UNCLAS //N04030//
SECTION 01 OF 02 //N04030//
2D MARDIV/2D MAW/2D FSSG/FMFPAC FOR SC-39/SC-4/CEO; CMC FOR LMA-3 /LFT-1
SUBJ: LITHIUM BATTERIES
A. CMC WASHINGTON DC 281402Z MAR 83
B. COMMANDER NAVSEASYSCOM LTR 04H32/HTH SER 491 8020 DTD 25 MAY 1983 (NOTAL)
C. COMNAVSURFLANT NORFOLK VA 170223Z JUL 83 NOTAL
D. CG FMFLANT 301902Z JUN 83
E. NAVSEAINST 9310.1A
1. PURPOSE. THE PURPOSE OF THIS MSG IS TO PROVIDE A SINGLE DOCUMENT FOR THE HANDLING AND DISPOSAL OF LITHIUM-SULFUR DIOXIDE BATTERIES IAW REFS A THRU E.
2. SAFETY CONSIDERATIONS.
A. GENERAL INFORMATION. THE LITHIUM BATTERY IS A HIGH ENERGY POWER SOURCE THAT CONTAINS LITHIUM METAL, SULFUR DIOXIDE, AND ORGANIC MATERIALS UNDER PRESSURE. THE CONTENTS ARE POTENTIALLY FLAMMABLE, EXPLOSIVE, TOXIC, AND/OR NOXIOUS. THE LITHIUM METAL PRESENT IN THE BATTERY/CELL CAN BURN WHEN EXPOSED TO AIR. BURNING LITHIUM BATTERIES/CELLS CAN CREATE HYDROGEN GAS WHEN IN CONTACT WITH WATER.
SAFETY FEATURES OF THE BATTERY INCLUDE:
(1) THE BATTERY IS PROTECTED BY A SLOW-BLOW REPLACEABLE FUSE. THIS FUSE MUST NOT BE BYPASSED OR REPLACED BY A HIGHER AMPERAGE FUSE BECAUSE OF THE POSSIBILITY OF EXCESSIVE INTERNAL CURRENTS OR SHORT CIRCUITS.
(2) EACH CELL INCORPORATES A VENTING DEVICE WHICH RELEASES PRESSURE IF IT EXCEEDS 350-450 PSI, WHICH IS NORMALLY CAUSED BY OVERHEATING. THE VENT IS DESIGNED TO PREVENT THE CELL FROM RUPTURING. IF VENTING OCCURS, SULFUR DIOXIDE WILL BE RELEASED, AND IRRITATION TO THE EYES AND RESPIRATORY SYSTEM WILL OCCUR LONG BEFORE TOXIC CONCENTRATIONS ARE REACHED.
(3) A THERMAL CURRENT INTERUPTER IS BEING INCORPORATED INTO LITHIUM BATTERIES TO SHUT DOWN BATTERY OPERATIDN IF THE INTERNAL TEMP EXCEEDS 191 DEGREES F.
B. SAFETY EQUIPMENT.
(1) ALL LITHIUM BATTERY STORAGE AREAS SHALL BE EQUIPPED WITH CLASS D FIRE EXTINGUISHERS. IN THE EVENT THAT A CLASS D EXTINGUISHER IS NOT AVAILABLE FOR ANY REASON, A WATER EXTINGUISHER MAY BE USED; IN SUCH CASES, EFFORT SHOULD BE TO PREVENT THE SPREAD OF THE FIRE TO OTHER COMBUSTIBLES AND NOT DIRECTED ON EXTINGUISHING THE BURNING LITHIUM BATTERIES/CELLS.
(2) AIR RESPIRATORS OR SELF-CONTAINED BREATHING APPARATUS APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH) SHALL BE WORN WHEN ENTERING STORAGE SPACES WHERE LITHIUM BATTERIES ARE VENTING OR HAVE VENTED.
C. THE FOLLOWING PROCEDURES SHOULD BE OBSERVED WHEN LITHIUM BATTERIES ARE USED:
(1) PRIOR TO ANY HANDLING/USAGE, LITHIUM BATTERIES SHOULD BE VISUALLY INSPECTED FOR ANY INDICATION OF DETERIORATION, MOISTURE WITHIN OR INFLATION OF THE PLASTIC WRAP/BAG, OR PUNGENT ODOR.
DO NOT USE THE BATTERY IF ANY OF THESE CONDITIONS EXIST.
(2) BATTERIES ARE TO BE OPENED CAREFULLY IN A WELL VENTILATED AREA AND ARE TO BE HELD AWAY FROM THE FACE WHEN REMOVING THE PLASTIC BAG/WRAP
(3) AFTER BATZRY INSTALLATION INTO THE EQUIPMENT, IF AN OPERATOR DETECTS THE BATTERY COMPARTMENT BECOMING HOT, HEARS CELLS VENTING (HISSING SOUND), OR SMELLS THE IRRITATING PUNGENT GAS SMELL, (SULFUR DIOXIDE GAS) THE FOLLOWING IMMEDIATE ACTIONS WILL BE PERFORMED:
(A) TURN OFF THE EQUIPMENT.
(B) MOVE PERSONNEL OUT OF THE IMMEDIATE AREA.
(C) ALLOW ONE HOUR FOR THE BATTERY TO COOL. IF THE BATTERY IS NOT COOL TO THE TOUCH MORE TIME MAY BE NECESSARY.
(D) WHEN THE BATTERY IS COOL TO THE TOUCH, CAREFULLY REMOVE IT FROM THE EQUIPMENT'(USE OF GLOVES AND PROTECTIVE MASK ARE RECOMMENDED).
(E) PACKAGE THE FAULTY BATTERY IN A PLASTIC BAG (SEALING THE BAG WITH TAPE) AND RETURN TO ORIGINAL FIBERBOARD SHIPPING CONTAINER OR EQUIVALANT PROTECTION. IF THE BATTERY CANNOT BE REMOVED FROM THE EQUIP, PROVIDE LIKE PACKAGING/PROTECTION FOR THE EQUIPMENT.
(F) SEGREGATE THE BATTERY/EQUIP TO PREVENT UNDUE HANDLING OR HAZARD TO PERSONNEL AND REPORT THE INCIDENT/CIRCUMSTANCES AS INDICATED IN FOLLOWING PARA.
D. LITHIUM BATTERY INCIDENT REPORTS. A REPORT WILL BE SUBMITTED TO THE OPERATIONAL COMMANDER WITH INFO COPIES TO CG FMFLANT (CEO), CG FMFPAC (CEO), AND CMC (CODE LMA-3) WHENEVER A LEAKAGE, VENTING, OR RUPTURE OF A LITHIUM BATTERY OR CELL IS DISCOVERED/OCCURS. THE FOLLOWING DETAILS WILL BE PROVIDED AS A MINIMUM:
(1) TYPE OF BATTERY INVOLVED.
(2) MANUFACTURER (MFR) OF BATTERY.
(3) CONTRACT LOT NUMBER.
(4) MFR DATE.
(5) BATTERY SERIAL NUMBER.
(6) WHAT HAPPENED.
(7) PRESENT LOCATION/DISPOSITION OF THE BATTERY.
(8) POINT OF CONTACT FOR ADDITIONAL INFORMATION.
E. CUSTODY OF LITHIUM BATTERIES. POSITIVE PROCEDURES WILL BE ESTABLISHED TO ENSURE THAT THE FOLLOWING TYPES OF EVENTS CANNOT OCCUR (POSSIBLY BY USING A ONE FOR ONE EXCHANGE):
(1) USED LITHIUM BATTERIES BEING REMOVED FROM THE WORKING AREA INTO RESIDENTIAL AREAS.
(2) USED LITHIUM BATTERIES BEING DISCARDED IN THE FIELD.
(3) USED LITHIUM BATTERIES REMAINING IN THE WORKING AREAS INSTEAD OF BEING TURNED INTO SUPPLY FOR DISPOSAL.
3. STORAGE OF LITHIUM BATTERIES. THE FOLLOWING PROVIDES GENERAL GUIDELINES FOR THE STORAGE OF LITHIUM BATTERIES.
A. STORAGE OF NEW LITHIUM BATTERIES IN GARRISON. REF A PROVIDES SPECIFIC DETAILS; HOWEVER, THE FOLLOWING GENERAL GUIDELINES ARE PROVIDED:
(1) LITHIUM BATTERIES SHALL BE STORED IN ORIGINAL SHIPPING CONTAINERS IN A COOL, SPRINKLER PROTECTED, AND VENTILATED SHELTER IF POSSIBLE.
(2) THE STORAGE AREA SHALL BE ISOLATED FROM OTHER HAZARDOUS AND COMBUSTIBLE MATERIAL.
(3) THE STACKS OF LITHIUM BATTERIES SHALL BE LIMITED AMD WILL NOT EXCEED 2,000 SQFT OF STORAGE NOT TO EXCEED 25 FT IN WIDTH OR 16 FT IN HEIGHT. FIRE LANES OF 8 FT BETWEEN STACKS AND A MINIMUM CLEARANCE OF 3 FT FROM ALL WALLS, SPRINKLER SYSTEMS, AND CEILINGS WILL BE ADHERED TO.
(4) STORAGE TEMPERATURES ABOVE 130 DEGREES F SHALL BE AVOIDED.
(5) SPECIAL CARE SHALL BE EXERCISED IN THE HANDLING AND MOVING OF CONTAINERS TO PREVENT POSSIBLE CRUSHING OR PUNCTURING OF BATTERIES.
B. STORAGE OF NEW LITHIUM BATTERIES ABOARD SHIP. REF B PROVIDES THE FOLLOWING GUIDANCE.
(1) STORAGE ON WEATHER DECKS:
(A) LITHIUM BATTERIES SHALL BE STORED IN THEIR ORIGINAL SHIPPING BT

(continued on reverse)

CMC WASH DC 12
COG L-S(11) (M,C)
INFO TFK CK-S(1)

PRIORITY ZYUW RHCJSGG5680 2501125
P 071358Z SEP 83
FM CG FMFLANT
TO FMFLANT
INFO CMC WASHINGTON DC CG FMFPAC

UNCLAS
FINAL SECTION OF 02 //N04030//
CONTAINERS IN A JETTISONABLE TYPE, DRIP PROOF VENTILATED LOCKER CAPABLE OF MAINTAINING THE STORAGE TEMPERATURE BELOW 130 DEGREES FAHRENHEIT.
(B) THE STORAGE LOCKER SHALL BE ISOLATED FROM OTHER HAZARDOUS AND COMBUSTABLE MATERIEL AND SHALL BE USED ONLY FOR THE STORAGE OF NEW AND UNUSED LITHIUM BATTERIES.
(2) STORAGE BELOW THE DECKS:
(A) LITHIUM BATTERIES SHALL BE STORED IN THEIR ORIGINAL SHIPPING CONTAINERS IN A COOL, SPRINKLER PROTECTED, VENTILATED AREA AND THE STORAGE TEMPERATURE SHALL BE MAINTAINED BELOW 130 DEGREES F.
(B) THE STORAGE AREA SHALL BE ISOLATED FROM OTHER HAZARDOUS AND COMBUSTIBLE MATERIAL AND SHALL BE USED ONLY FOR THE STORAGE OF NEW AND UNUSED LITHIUM BATTERIES. ISOLATION SHALL BE PROVIDED UTILIZING EQUIVALENT BARRIERS TO THOSE USED TO SEPARATE NON-COMPATIBLE STOWS OF L FORM AMMUNITION.
(C) LITHIUM BATTERIES AND LITHIUM POWERED EQUIPMENT WITH BATTERIES INSTALLED SHALL NOT BE STORED IN BERTHING AREAS.
C. STORAGE OF NEW BATTERIES IN A FIELD ENVIRONMENT. THE PROVISIONS OF PARA 3.A ABOVE WILL BE COMPLIED WITH AS MUCH AS POSSIBLE.
D. STORAGE OF USED LITHIUM BATTERIES IN GARRISON. THE PROVISIONS OF PARA 3.A SHALL BE FOLLOWED WITH THE FOLLOWING EXCEPTIONS:
(1) USED/DEPLETED LITHIUM BATTERIES ARE TO BE SEGREGATED FROM NEW LITHIUM BATTERIES.
(2) BATTERIES SHALL BE INDIVIDUALLY SEALED IN A PLASTIC BAG OR WRAPPED IN ELECTRIC INSULATING TAPE, STORED IN A WOODEN BOX OR STRONG FIBERBOARD CONTAINER OF THE SAME OR GREATER CONSTRUCTION AS THE ORIGINAL SHIPPING CONTAINERS (SAVE THE ORIGINAL SHIPPING CONTAINERS FOR THIS PURPOSE).
(3) USED LITHIUM BATTERIES SHALL NOT BE ALLOWED TO ACCUMULATE (NOT MORE THAN 30 DAYS OR 30 LBS) AND SHOULD BE DISPOSED OF PROMPTLY.
E. STORAGE OF USED LITHIUM BATTERIES ABOARD SHIP. REF B STATES "USED OR DEPLETED LITHIUM BATTERIES SHALL ONLY BE STORED ON THE WEATHER DECKS. BELOW DECK STORAGE OF USED OR DEPLETED LITHIUM BATTERIES IS PROHIBITED". THE FOLLOWING GUIDANCE IS ALSO PROVIDED BY REF B:
(1) USED OR DEPLETED LITHIUM BATTERIES SHALL BE STORED IN THEIR ORIGINAL PACKAGING CONTAINERS IN A JETTISONABLE TYPE, DRIP PROOF, VENTILATED LOCKER, CAPABLE OF MAINTAINING THE STORAGE TEMPERATURE.
4. DISPOSAL OF LITHIUM BATTERIES. USED/DEPLETED LITHIUM BATTERIES WILL NOT BE STORED IN EXCESS OF THIRTY DAYS OR EXCEED THIRTY POUNDS WHILE AWAITING DISPOSAL IAW REFS A AND D. THE MEANS OF DISPOSING OF USED/DEPLETED LITHIUM BATTERIES WILL BE DISCUSSED IN THIS PARAGRAPH. IT WILL NOT DISCUSS THE SUPPLY ACCOUNTABILITY OR DOCUMENTATION PROCEDURES, THESE WILL BE IAW STANDARD SUPPLY PROCEDURES.
A. DISPOSAL WITHIN CONUS. USED/DEPLETED LITHIUM BATTERIES MAY BE TURNED INTO THE NEAREST DEFENSE PROPERTY DISPOSAL SFFICE (DPDO) ACTIVITY. THE BATTERIES MUST BE PROPERLY IDENTIFIED, OF BALANCED CELL DESIGN AND CERTIFIED AS SUCH, AND BE PROPERLY PACKAGED. REF D PROVIDED GENERAL GUIDELINES ON THE PACKAGING AND TRANSPORTATION OF LITHIUM BATTERIES.
B. DISPOSAL AT SEA. IAW REF E, USED/DEPLETED LITHIUM BATTERIES MAY BE DISPOSED OF AT SEA PROVIDING THE VESSEL IS OVER 50 MILES FROM SHORE AND THE DEPTH OF THE WATER IS IN EXCESS OF 500 FEET. REF E FURTHER STATES THAT BATTERIES WILL NOT BE STORED ABOARD SHIP FOR DISPOSAL ASHORE.
C. DISPOSAL GUIDELINES OUTSIDE OF CONUS.
(1) DISPOSAL IAW HOST NATION SUPPORT AGREEMENTS IS THE PREFERRED METHOD.
(2) THE NEXT PREFERRED METHOD IS TO TURN THE BATTERIES INTO A DPDO ACTIVITY IF POSSIBLE.
(3) BATTERIES SHOULD BE RETROGRADED TO AMPHIBIOUS SHIPPING FOR DISPOSAL AT SEA IF THE ABOVE LISTED METHODS ARE NOT POSSIBLE.
(4) UNITS BEING DEPLOYED/REDEPLOYED BY MAC AIRLIFT MUST USE AN ALTERNATE POWER SOURCE (E.G. BB 590) IF POSSIBLE, WHEN HOST NATION DISPOSAL, A DPDO ACTIVITY OR AMPHIBIOUS SHIPPING ARE UNAVAILABLE. HOWEVER, IF LITHIUM BATTERIES MUST BE USED THE FOLLOWING METHOD OF DISPOSAL MAY BE REQUIRED ONLY AS A LAST RESORT:
(A) DISPOSAL WILL BE ACCOMPLISHED BY BURNING. A PIT TWO FEET DEEP AND SUFFICIENT TO PLACE A USED AMMO CAN IN WILL BE USED. THE AMMO CAN SHOULD BE FILLED WITH HEAT TABS TO BURN THE BATTERIES.
A SMALL GRILL OVER THE AMMO CAN TO EXPEDITE BURNING IS RECOMMENDED. THIS WILL ALLOW THE FIRE TO HAVE GREATER EFFECT ON THE BATTERIES. ONCE BURNING IS COMPLETE THE BATTERY REMAINS SHOULD BE BURIED IN THE PIT.
(B) SAFETY CONSIDERATIONS. PERSONNEL BURNING THE BATTERIES SHOULD WEAR A PROTECTIVE MASK AND REMAIN UPWIND. BURNING SHOULD TAKE PLACE IN AN ISOLATED AREA AWAY FROM PEOPLE. BT

CMC WASH DC
COG L-S(11)
INFO TFK CK-S(1)

12

(M,C)

MCN=83251/05952 TOR=83251/0429Z TAD=83251/0519Z CDSN=MAX994

PRIORITY ZYUW RHCJSGG8763 1811902
P 301902Z JUN 83
FM CG FMFLANT
TO CG SECOND MARDIV CG SECOND MAW
CG SECOND FSSG
INFO CMC WASHINGTON DC CG FMFPAC
HQ MAC SCOTT AFB IL//LNM//

UNCLAS //N04030//
SECTION 01 OF 02 //N04030//
2D MARDIV/2D MAW/2D FSSG/FMFPAC FOR SC-39/SC-4/CEO; CMC FOR LMA-3/LFT-1
SUBJ: LITHIUM BATTERY PACKAGING AND TRANSPORTATION PROCEDURES
A. DOT E 7052
B. HQ AFLC WRIGHT PATTERSON OH 031215Z FEB 83
C. MCO P4030.19D/AFR 71-4
D. CMC WASHINGTON DC 111403Z APR 83
E. COMMANDER, NAVSEASYSCOM 04H32/HTH SER 491 8020 DTD 25 MAY 1982
F. DOTE 8441
G. CFR 49
H. TARIFF NO. 130E-6000-A
I. HQ AFLC WRIGHT PATTERSON AFB OH 191550Z APR 83
1. PURPOSE. THE PURPOSE OF THIS MSG IS TO PROMULGATE POLICIES FOR THE SAFE PACKING AND TRANSPORTATION OF LITHIUM-SULFUR DIOXIDE BATTERIES IAW REFS A THRU I.
2. INFORMATION. THE LITHIUM-SULFUR DIOXIDE BATTERY REPRESENTS A MAJOR BREAKTHROUGH AS A PRIMARY DIRECT CURRENT SOURCE FOR COMMUNICATIONS AND ELECTRONICS EQUIPMENT. HOWEVER, THERE ARE DANGERS ASSOCIATED WITH CARELESS HANDLING, STORAGE, USE, AND DISPOSAL. THE LITHIUM-SULFUR DIOXIDE BATTERIES CURRENTLY BEING USED IN THE MARINE CORPS AND THE GRAMS OF LITHIUM THEY CONTAIN ARE LISTED BELOW (READ IN FOUR COLUMNS):

BATTERY TYPE	GRAMS LITHIUM PER CELL	CELLS PER BATTERY	TOTAL GRAMS OF LITHIUM
A. BA-5590	2.7-4.0	10	27-40
B. BA-5598	1.7	5	13.5
C. BA-5588	1.8	5	9.0

3. TRANSPORTATION OF LITHIUM BATTERIES. LITHIUM BATTERIES MAY NOT BE TRANSPORTED BY ALL MEANS OF TRANSPORTATION USED BY MARINES. THE MATRIX SHOWN BELOW AND IN SUB PARAGRAPHS ARE INTENDED AS A READY REFERENCE FOR POTENTIAL SHIPPERS:
A. TRANSPORTATION MATRIX FOR LITHIUM BATTERIES (READ IN FIVE COLUMNS).

CARRIER	BAT ONLY	BAT W/PAX	BAT IN EQUIP	USED BAT
COMM AIR	PARA 3.B	NO	NO	NO
MAC AIR	PARA 3.B	PARA 3.C	PARA 3.C	NO
USMC AIR	PARA 3.	PARA 3.D	PARA 3.D	PARA 3.E
COMM SHIP	PARA 3.F	NO	NO	PARA 3.F
AMPHIB SHIP	PARA 3.G	PARA 3.G	PARA 3.G	PARA 3.G
SUBMARINE	NO	NO	NO	NO
OTHER SHIPS	NO	NO	NO	NO
RAIL	PARA 3.F	NO	NO	PARA 3.F
MOTOR VEH	PARA 3.F	NO	NO	PARA 3.F,3.H

B. REF A AUTHORIZES THE TRANSPORTATION OF LITHIUM BATTERIES ABOARD CARGO ACFT ONLY.
(1) BATTERIES CONSTRUCTED OF CELLS CONTAINING NO MORE THAN 12 GRAMS OF LITHIUM (SEE PARA 2) MAY BE SHIPPED IN EITHER A STRONG WOODEN BOX, DOT 12B CONTAINERS (OR EQUIVALENT), DOT 21C FIBER DRUMS (OR EQUIVALENT), OR DOT 17H OR 17C CONTAINERS.
(2) BATTERIES CONSTRUCTED OF CELLS CONTAINING MORE THAN 12 GRAMS OF LITHIUM ARE REQUIRED TO BE TRANSPORTED IN REMOVABLE HEAD CONTAINERS DOT 17H, OR 17C CONTAINERS.
C. REF B GRANTED A WAIVER (AFLC 71-4-83-8) TO SHIP LITHIUM BATTERIES ABOARD PAX CARRYING ACFT PROVIDING THE PROVISIONS OF REF A (SEE PARA 2.A ABOVE) ARE COMPLIED WITH. PROVISIONS OF PARA 3-6 OF REF C (CONTINGENCY OR TACTICAL OPS) MUST BE CITED. IN REMARKS OF SAAM STATE "PROVISIONS OF CHAPTER 3, AFR 71-4/MCO P4030.19D APPLY." MAC PAX ACFT SHOULD BE EXERCISED ONLY WHEN SHIPMENT IN A "CARGO ONLY" CONFIGURATION IS NOT AVAILABLE TO MEET OP REQUIREMENTS.
D. REF D AUTHORIZES TRANSPORTATION OF LITHIUM BATTERIES WITH PAX ABOARD USMC ACFT PROVIDING PROVISIONS OF REF A (SEE PARA 2.A ABOVE) ARE COMPLIED WITH. REF D FURTHER AUTHORIZES AND PROVIDED GUIDELINES FOR TRANSPORTATION OF EQUIPMENT WITH LITHIUM BATTERIES INSTALLED PROVIDING AN ALTERNATIVE POWER SOURCE IS NOT AVAILABLE AND THOSE DEVICES
ARE REQUIRED FOR IMMEDIATE REPEAT IMMEDIATE USE IN THE LANDING ZONE. COMSEC DEVICES WILL NOT HAVE LITHIUM BATTERIES INSTALLED. FOL CHECK LIST WILL BE FOLLOWED WHEN BATTERIES ARE TO BE INSTALLED IN EQUIP.
(1) CHECK EQUIPMENT TO INSURE LITHIUM BATTERIES ARE NOT INSTALLED IN COMSEC EQUIPMENT.
(2) OP-CHECK OF EQUIPMENT WILL OCCUR 45-60 MINUTES PRIOR TO EMBARK (THIS ALLOWS TIME FOR CHEMICAL PROPERTIES OF BATTERIES TO STABILIZE).
(3) TEAM/ACFT COMMANDER WILL PHYSICALLY INSPECT EACH DEVICE CONTAINING LITHIUM BATTERIES TO ENSURE DEVICES ARE TURNED OFF PRIOR TO AND DURING EMBARK OF AIRCRAFT.
(4) DEVICES CONTAINING LITHIUM BATTERIES WILL BE STAGED IN A LOCATION PHYSICALLY SEGREGATED FROM AIRCREW/PAX TO MAX EXTENT POSSIBLE AND ALLOWING JETTISONING OF EQUIPMENT. JETTISON CAPABILITY PRECLUDES AIR SHIPMENT OF COMSEC EQUIPMENT WITH LITHIUM BATTERIES INSTALLED.
E. REF D AUTHORIZES THE TRANSPORTATION (EXTERNAL LIFT ONLY) OF USED LITHIUM BATTERIES VIA HELICOPTER PROVIDING GROUND TRANSPORTATION IS NOT POSSIBLE. FOL GUIDELINES APPLY:
(1) LIFT SHALL BE TO NEAREST POINT SURFACE TRANSPORTATION IS POSSIBLE.
(2) ONLY STRONG OUTSIDE CONTAINERS (PREFERRABLY METAL) WITH VENTING CAPABILITY SHALL BE USED.
(3) ALL PERSONNEL INVOLVED IN AIRLIFT WILL BE BRIEFED (I.E. AIRCREW AND HST PERSONNEL AT DEPARTURE AND RECEPTION LZ) ON NATURE OF MATERIAL AND SPECIAL HANDLING PROCEDURES.
(4) FLIGHT CREW PERSONNEL WILL BE AWARE OF ALL NATOPS PROCEDURES FOR EXTERNAL TRANSPORTATION OF HAZARDOUS CARGO.
F. REF A AUTHORIZES SHIPMENT OF THESE BATTERIES BY COMMERCIAL CARGO VESSELS AND MOTOR VEHICLES. BATTERIES MAY BE SHIPPED IN EITHER A STRONG WOODEN BOX, DOT 12B CONTAINERS (OR EQUIVALENT), DOT 21C FIBER DRUMS (OR EQUIVALENT), OR DOT 17H OR 17C CONTAINERS. REF A DOES NOT AUTHORIZE THE TRANSPORTATION OF LITHIUM BATTERIES DISCHARGED TO LESS THAN 2 VOLTS PER CELL OR BATTERIES CONTAINING ONE OR MORE SUCH CELLS.
G. REF E AUTHORIZES SHIPMENT OF THESE BATTERIES ABOARD AMPHIBIOUS SHIPS. THE PROVISIONS OF REF A APPLY FOR PACKAGING.
(1) NEW/UNUSED BATTERIES MAY BE STORED ON WEATHER DECKS OR BELOW DECKS PROVIDING TEMPERATURES CAN BE MAINTAINED BELOW 130 DEGREES, STORAGE IS VENTILATED, AND ARE ISOLATED FROM OTHER HAZARDOUS CARGO AND COMBUSTABLE MATERIALS.
(A) WEATHER DECK STORAGE CONTAINERS MUST BE JETTISONABLE, DRIP PROOF, AND VENTILATED.
(B) BELOW DECKS STORAGE MUST BE SPRINKLER PROTECTED.
(2) LITHIUM BATTERIES AND EQUIPMENT CONTAINING LITHIUM BATTERIES WILL NOT BE STORED IN BERTHING AREAS.
(3) LITHIUM BATTERIES MAY BE INSTALLED IN EQUIPMENT IN TOPSIDE LOCAT-
BT

(Continued on reverse)

CMC WASH DC 12
COG L-S(11) (M,C)
INFO TFK CK-S(1)

ARLINGTON ANNEX
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PRIORITY ZYUW RHCJSGG8764 1611902
P 301902Z JUN 83
FM CG FMFLANT
TO CG SECOND MARDIV CG SECOND MAW
CG SECOND FSSG
INFO CMC WASHINGTON DC CG FMFPAC
HQ MAC SCOTT AFB IL//LNM//

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FINAL SECTION OF 02 //N04030//
IONS ONLY. EQUIPMENT CHECKS WILL BE HELD TO A MINIMUM.
(4) USED OR DEPLETED LITHIUM BATTERIES SHALL BE STORED IN THEIR ORIGINAL OR COMPARABLE PACKAGING IN THE JETTISONABLE NONCOMBUSTABLE CONTAINERS.
H. TRANSPORT OF USED BATTERIES IS DISCUSSED IN PARA 3.F ABOVE. HOWEVER, TRANSPORTATION OF LITHIUM BATTERIES FOR DISPOSAL IS GUIDED BY REF F. (REF F IS BEING INCORPORATED INTO REF G; HOWEVER, LABEL WILL READ ORM-C). THE PACKAGING REQUIRED IS DOT CONTAINER 12B FIBERBOARD BOX WITH GROSS WEIGHT NOT TO EXCEED 65 POUNDS.
4. PACKAGING CONTAINERS. ACTUAL PACKAGING SHALL BE IN ACCORDANCE WITH REFS G OR H. THE PURPOSE OF THIS PARAGRAPH IS TO PROVIDE GENERAL INFORMATION ON THESE REFS AND TO POINT OUT PUBLISHED GUIDANCE FR OTHER AUTHORITY.
A. DOT CONTAINER 12B. LITHIUM BATTERIES (BA 5590) ORIGINAL SHIPPING CONTAINER IS AN EXAMPLE OF THIS CONTAINER.
B. DOT CONTAINERS 17C OR 17H. THESE ARE STEEL DRUMS WITH A REMOVABLE LID. THE LID IS SECURED WITH A METAL RING AND A NUT AND BOLT FASTENER.
C. REF I CLARIFIES THAT SHIPMENT OF NEW LITHIUM BATTERIES IN THEIR ORIGINAL OR SUBSTITUTE SHIPPING CONTAINERS MUST MEET DOT CONTAINER 12B SPECS AND MAY BE SHIPPED BY MAC AIR. THIS REF ALSO STATES PACKING OF LOTS OF LITHIUM BATTERIES MAY BE SHIPPED IN AMMO CAN, OVER PACKED WITH STRONG WOODEN BOXES (INSIDE MOUNT-OUT BOXES).
5. LABELS/MARKING. SHIPMENT OF LITHIUM BATTERIES REQUIRES HAZARDOUS CARGO CERTIFICATION AND LABELING OF THE HAZARD.
A. HAZARDOUS CARGO CERTIFICATION (DD FORM 1387-2) WILL BE ATTACHED TO SHIPMENT CONTAINERS BEING AIRLIFTED. IN ADDITION A COPY OF THE FOL REFS WILL BE ATTACHED DEPENDING ON TRANSPORTATION MODE.
(1) MAC AIR-REFS A. B, I
(2) COMM AIR-REF A
(3) USMC AIR-REF D
(4) COMM SHIP-REF A
(5) AMPHIB SHIP-REF E.
(6) RAIL/MOTOR VEHICLE-REF A (DISPOSAL REF A)
(1) NEW OR USED BATTERIES WILL HAVE A SHIPPING LABEL SHOWING FLAMMABLE SOLID.
(2) BATTERIES BEING TRANSPORTED FOR DISPOSAL WILL HAVE A SHIPPING LABEL SHOWING ORM-C.
6. DISPOSAL AND HANDLING OF LITHIUM BATTERIES WILL BE THE SUBJECT OF SEP COR. BT

CMC WASH DC 12
COG L-S(11) (I,M)
INFO TFK CK-S(1)

MCN=83182/02719 TOR=83182/0214Z TAD=83182/0217Z CDSN=MACO80

PRIORITY
R 061403Z JUN 83 ZYUW RUEACMC4151 1612334
FM CMC WASHINGTON DC
TO CG FMFLANT
CG LFTCLANT NORFOLK VA
MCCES TWENTYNINE PALMS CA
AIG EIGHT
CG FMFPAC
CG FOURTH FSSG
MARBKS GUANTANAMO BAY CUBA
INFO CDRCECOM FT MONMOUTH NJ //DRSEL-MMG-B//
CDRERADCOM FT MONMOUTH NJ //DELET-PB//
CDRERADCOM ADELPHI MD //DRDEL-SS//
XMT CG MCRD PARRIS ISLAND SC
HQBN HQMC ARLINGTON VA
FIRST MARCORDIST GARDEN CITY LI NY
MARFINCEN KANSAS CITY MO
CG MCRD SAN DIEGO CA
MARBKS WASHINGTON DC

UNCLAS //N04400//
SECTION 01 OF 02
SUBJ: SAFETY OF USE MESSAGE, ADVISORY, TECHNICAL. BATTERY BA-5590, NSN 6135-01-036-3495, CONTRACTS DAAB07-80-D-6502, MALLORY AND DAAB07-81-D-6526, DURACELL (CMC CODE LMA-3)
NOTE: THIS IS A SAFETY ADVISORY MESSAGE THAT HAS NOT, REPEAT HAS NOT, BEEN TRANSMITTED TO UNITS SUBORDINATE TO ADDRESSEES. ADDRESSEES SHOULD IMMEDIATELY RETRANSMIT THIS MESSAGE TO ALL SUBORDINATE UNITS, ACTIVITIES OR ELEMENTS AFFECTED OR CONCERNED.
A. CMC WASHINGTON DC 151402Z APR 83
B. CMC WASHINGTON DC 041403Z JUN 83
1. THE REFS ADDRESSED DEFECTS IN BATTERIES MANUFACTURED UNDER THE SUBJECT CONTRACTS. THE BATTERIES WITH DEFECTS MAY BE IDENTIFIED BY VISUAL EXAMINATION AND WILL DISPLAY ONE OR MORE OF THE FOLLOWING CONDITIONS:
A. MOISTURE/DROPLETS WITHIN POLYETHYLENE (PLASTIC) BAG/CASING
B. DISTENSION/BULGING OF THE PLASTIC BAG/CASING
C. DISTENSION/BULGING OF THE BATTERY CASE
D. EVIDENCE OF BATTERY CASE DETERIORATION
NOTE: UNSATISFACTORY OPERATION OFA BATTERY WHICH APPEARS NORMAL DOES NOT IN ITSELF QUALIFY THE BATTERY AS DEFECTIVE. REFER TO PARA 5. BE LOW FOR ADDITIONAL INFO ON REPORTING SUCH BATTERIES.
2. AN INVESTIGATION OF AN INCIDENT AT MCAS CHERRY POINT, NC. HAS DISCLOSED THAT BATTERIES DISPLAYING THE ABOVE DEFECTS ARE POTENTIALLY MORE VOLATILE/HAZARDOUS THAN LITHIUM SULFUR DIOXIDE (LISO2) BATTERIES WHICH APPEAR NORMAL. FURTHER, BATTERIES FROM THE SAME CONTRACT/MANUFACTURE DATE WHICH DO NOT YET OUTWARDLY DISPLAY DEFECT INDICATORS MAY HAVE BEEN SUBJECTED TO THE SAME DISCREPANCIES IN THE MANUFACTURING PROCESS AND MUST ALSO BE SUBJECTED TO EXCEPTIONAL HANDLING.
3. TO MINIMIZE HAZARDS (PRIMARLY TOXIC) PRESENTED BY DEFECTIVE AND POTENTIALLY DEFECTIVE BATTERIES. ALL BA-5590 BATTERIES FROM THE FOLLOWING CONTRACTS AND ASSOCIATED MANUFACTURE DATES (LOTS) SHALL BE IMMEDIATELY REMOVED FROM SERVICE AND EITHER PRESENTED FOR DISPOSAL (DEFECT INDICATORS PRESENT) OR PLACED IN PROTECTED STORAGE (NO DEFECT INDICATORS PRESENT):

CONTRACT	MANUFACTURER	MFR DATES/LOTS
DAAB07-80-D-6502	MALLORY	1080, 1180, AND 1280
DAAB07-81-D-6526	DURACELL	1181, 0282, AND 0382

NOTE: BATTERIES FROM THE ABOVE CONTRACTS HAVING OTHER MFR DATES SHALL REMAIN IN SERVICE UNLESS OTHERWISE DIRECTED BY THIS HQ. HOWEVER, SUCH BATTERIES ARE SUSPECT, ARE TO BE HANDLED WITH CAUTION AND ARE TO BE INSPECTED FREQUENTLY FOR SIGNS OF DETERIORATION/DEFECTS.
4. PROCEDURES.
A. SAFETY. PERSONNEL INSPECTING/HANDLING BATTERIES FROM THE ABOVE NOTED "DEFECTIVE" CONTR/MFR DATES SHOULD WEAR RUBBER GLOVES/APRONS AND NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS.
B. HANDLING. BATTERIES FROM "DEFECTIVE" CONTR/MFR DATES ARE TO BE HANDLED WITH EXTREME CAUTION DURING INSPECTION/PACKING/TRANSPORT. IF THE BATTERIES ARE NEW, DO NOT REMOVE THEM FROM THEIR ORIGINAL PLASTIC BAGS/CASINGS.
C. INVENTORY. A RECORD MUST BE MAINTAINED OF ALL BATTERIES FROM THE "DEFECTIVE" CONTR/MFR DATES WHICH ARE REMOVED FROM SERVICE AND EITHER PRESENTED FOR DISPOSAL OR PLACED IN PROTECTED STORAGE. THE FOLLOWING INFO IS TO BE COLLECTED AND FORWARDED TO THIS HQ (LMA-3) NO LATER THAN 20 JUNE 1983: CONTRACT/MFR DATE/QTY DISPOSED OF OR PLACED

CMC WASH DC
ACTION L-S(11) 24
INFO CC-S(10) M-S(1) POC-S(1) TFK CK-S(1) (I,M)

MCN=83161/28540 TOR=83161/2333

IN PROTECTED STORAGE/SER NO(S)/CONDITION (NEW/USED)/DEFECT INDICATOR USE ALPHA CODE A-D FROM PARA 1. PRECEEDING TO IDENTIFY DEFECT INDICATOR: USE "E" FOR BATTERIES APPEARING NORMAL. ADDITIONAL CODES MAY BE UTILIZED FOR OTHER DEFECTS: INCLUDE EXPLANATION OF ADDITIONAL CODE(S).
D. PACKAGING FOR DISPOSAL.
(1) DPDS HAS INDICATED THAT THE FOLLOWING PACKAGING PROCEDURES ARE ACCEPTABLE FOR TURN-IN OF DAMAGED/DEFECTIVE LITHIUM BATTERIES:
(A) PLACE BATTERY IN PLASTIC BAG AND SECURE WITH NON-METALLIC FASTENING (TAPE). THE INTEGRITY OF THE BAG MUST BE MAINTAINED. IF THE BATTERY IS DAMAGED AND MIGHT TEAR THE BAG, PLACE THE BATTERY IN A FIBERBOARD BOX PRIOR TO BAGGING.
(B) PLACE THE BAGGED BATTERY INSIDE FIBERBOARD BOX AND TAPE CLOSED.
(C) BAGGED/BOXED BATTERIES MAY BE OVERPACKED IN FIBERBOARD CONTAINERS. TOTAL CONTAINER WEIGHT MUST NOT EXCEED 65 POUNDS.
(D) OUTSIDE CONTAINER MUST BE MARKED "LITHIUM BATTERIES FOR DISPOSAL" AND "ORM-C".
(2) SECURELY FASTEN AN INVENTORY OF CONTENTS (CONTR/MFR DATE/SER NO(S)/QTY) AND OWNING UNIT IDENT ON OUTSIDE CONTAINER.
(3) ALTHOUGH NOT REQUIRED BY DPDS, IT IS RECOMMENDED THAT BATTERY CONTAINERS BE PLACED WITHIN METAL DRUMS WITH FASTENABLE LIDS OR IN DISPOSAL DRUMS (NSN 8110-01-101-4055) WHILE BATTERIES ARE IN STORAGE PENDING DISPOSAL.
(4) IT IS RECOMMENDED THAT ALL BATTERIES IDENTIFIED FOR PROTECTED STORAGE BE CONSOLIDATED UNDER THE CONTROL OF A SINGLE MANAGER AT EACH
BT

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PRIORITY ZYUW RUEACMC4151 1612334
R 061403Z JUN 83
FM CMC WASHINGTON DC
TO CG FMFLANT CG FMFPAC
CG LFTCLANT NORFOLK VA CG FOURTH FSSG
MCCES TWENTYNINE PALMS CA MARBKS GUANTANAMO BAY CUBA
AIG EIGHT
INFO CDRCECOM FT MONMOUTH NJ //DRSEL-MMG-B//
CDRERADCOM FT MONMOUTH NJ //DELET-PB//
CDRERADCOM ADELPHI MD //DRDEL-SS//
XMT CG MCRD PARRIS ISLAND SC CG MCRD SAN DIEGO CA
HQBN HQMC ARLINGTON VA MARBKS WASHINGTON DC
FIRST MARCORDIST GARDEN CITY LI NY
MARFINCEN KANSAS CITY MO

UNCLAS //N04400//
FINAL SECTION OF 02
USMC INSTALLATION AND STORED IN THE SINGLE MOST NEARLY CONFORMING STORAGE FACILITY AT THAT INSTALLATION.
(5) ENSURE THAT BATTERIES ARE STORED/PROTECTED IN A RESTRICTED ACCESS, COOL, WELL VENTILATED LOCATION UNTIL CUSTODY IS PASSED TO SERVING DPDO (DEFECTIVE BATTERIES) OR APPOINTED STORAGE MANAGER (BATTERIES W/O DEFECT INDICATORS).
5. AS INDICATED IN PARA 1. PRECEEDING, SEVERAL USMC UNITS HAVE REPORTED UNSATISFACTORY SERVICE FROM SOME OF THEIR BA-5590 LITHIUM BATTERIES, WITH THE MAJORITY BEING FROM CONTR/MFR DATES ADDRESSED HEREIN AS POTENTIALLY (OR ACTUALLY) DEFECTIVE. UNITS NOTING POOR BATTERY PERFORMANCE SHOULD PROVIDE THE FOLLOWING INFO, VIA THEIR CHAIN-OF-COMMAND, TO THIS HQ (LMA-3): CONTR/MFR DATE/SER NO(S)/QTY/APPLICATION (USE)/LENGTH OF SERVICE.
6. IN ADDITION TO THE REPORTING REQUIREMENTS LEVIED IN PARAGRAPHS 4.C AND 5 PRECEEDING, ADDRESSES ARE TO IMMEDIATELY REPORT ANY LITHIUM BATTERIES FROM OTHER CONTRACTS OR MANUFACTURE DATES (NOT TAKEN FROM SERVICE BY T+IS MESSAGE) WHICH DISPLAY DEFECTS. REPORTS ON SUCH BATTERIES ARE TO CONTAIN DATA REQUESTED IN PARA 4.C ABOVE.
7. THIS HQ WILL COORDINATE WITH THE ITEM MANAGER (CECOM) AND WILL TAKE ALL POSSIBLE ACTION TO GAIN REIMBURSEMENT OR CREDIT FOR AS YET UNUSED BATTERIES DISPOSED OF IAW THIS MESSAGE.
8. HQMC POC IS LTCOL W. N. LOWE, LMA-3, (A) 224-2039. BT

CMC WASH DC
ACTION L-S(11) 24
INFO CC-S(10) M-S(1) POC-S(1) TFK CK-S(1) (M,C)

MCN=83161/28684 TOR=83161/2333Z TAD=83162/0508Z CDSN=MAB158

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE ZYUW RUEACMC8537 1152257
R 221405Z APR 83
FM CMC WASHINGTON DC
TO CG FMFLANT
CG FMFPAC
CG LFTCLANT NORFOLK VA
CG FOURTH FSSG
MCCES TWENTYNINE PALMS CA
MARBKS GUANTANAMO BAY CUBA
AIG EIGHT
XMT CC MC=D PARFIS ISLAN: SC
XMT CG MCRD SAN DIEGO CA
HQBN HQMC ARLINGTON VA
MARBKS WASHINGTON DC
FIRST MARCORDIST GARDEN CITY LI NY
MARFINCEN KANSAS CITY MO

UNCLAS //N02900//
SUBJ: ACCOUNTABILITY FOR AND PHYSICAL CUSTODY OF LITHIUM SULFUR DIOXIDE (LISO2) BATTERIES (CMC CODE LMA-3)
A. HQ DPDS BATTLE CREEK MI 142019Z APR 83 (NOTAL)
B. CMC WASHINGTON DC 301405Z MAR 83
1. REF A PROVIDED HQ DPDS RESPONSE TO REF B QUERIES ON THE SUBJ OF LISO2 BATTERY DISPOSAL PROCEDURES. THE FOLLOWING PARAGRAPHS PROVIDE INFO EXTRACTED FROM THE DPDS RESPONSE.
2. LITHIUM BATTERY (PICK-UP) CONTRACT. "AWARD IS PROCEEDING ON SCHED-SCHEDULE. AWARD IS EXPECTED THIS MONTH (APR83), WITH CONUS-WIDE PICK UP NO LATER THAN 90 DAYS AFTERWARDS (COMPLETION IN JULY 83)". NOTE: THIS INITIAL CONTRACT IS PRIMARILY FOR PICK-UP OF UNBALANCED CELL LITHIUM BATTERIES; BALANCED CELL BATTERIES AWAITING DISPOSAL WILL ALSO BE COLLECTED.
3. "DPDO'S WILL ACCEPT ACCOUNTABILITY OF LISO2 BATTERIES EVEN IF THEY DON'T HAVE THE FACILITIES TO STORE THEM."
4. "ALL PROPERTY TURNED IN TO THE DPDOS MUST BE IN CONTAINERS THAT ARE NON-LEAKING AND SAFE TO HANDLE. IF THE LISO2 BATTERIES ARE TURNED IN TO THE DPDO IN CONTAINERS WHICH MEET THIS DEFINITION, AND IF THE BATTERIES ARE BALANCED (OF BALANCED CELL DESIGN), THE DPDO WILL TAKE PHYSICAL CUSTODY IF THERE IS CONFORMING STORAGE, OR MOST NEARLY CONFORMING STORAGE. DPDS IS NOW REVIEWING THE PREPARED PACKAGING AND TURN-IN POLICY WHICH YOU SUBMITTED IN THE REFERENCE, AS WELL AS A SIMILAR PROCEDURE SUBMITTED BY USERADCOM (ARMY). FROM THESE TWO, DPDS WILL COORDINATE AMOUNG THE SERVICES AN ACCEPTABLE TURN-IN PROCEDURE FOR DAMAGED/LEAKED LISO2 BATTERIES, INCLUDING PROPER PACKAGING. THIS PROCEDURE WILL BE SENT OUT FOR COORDINATION NLT 2 MAY 83." BT

CMC WASH DC
ACTION L(5)
INFO CC(1) POC(1) TFK CK(1)

8

(D,6)

MCN=83115/19076 TOR=83115/2225Z TAD=83115/2257Z CDSN=MACO47

ROUTINE ZYUW RUEACMC3541 1011958
R 111403Z APR 83
FM CMC WASHINGTON DC
TO CG FMFLANT CG FMFPAC
CGMCDEC QUANTICO VA CG FOURTH MAW
CG FOURTH MARDIV CG MCLB ALBANY GA
CG LFTCLANT NORFOLK VA CG FOURTH FSSG
CG MCAGCC TWENTYNINE PALMS CA CG MCLB BARSTOW CA
MCCES TWENTYNINE PALMS CA MARBKS GUANTANAMO BAY CUBA
INFO HQ AFLC WPAFB OH//LOZP// HQ MAC SCOTT AFB IL//TRKC/LNM//
HQ DA WASHINGTON DC//DAPE-HRS//
CDRCECOM FT MONMOUTH NJ //DRSEL-SF-ME//
CDRERADCOM FT MONMOUTH NJ //DELET-PB//
COMNAVSEASYSCOM WASHINGTON DC
CDRERADCOM ADELPHI MD //DRDEL-SS//
NAVMTO NORFOLK VA

UNCLAS //N02900//
SUBJ: AIR TRANSPORTATION OF BA-5590 LITHIUM BATTERIES (CMC CODE LMA-3/ASA-3)
A. CMC WASHINGTON DC 241402Z JAN 83 (NOTAL)
B. HQ AFLC WPAFB OH 031215Z FEB 83 (NOTAL)
C. MCO P4030.19D (AFR 71-4/TM 38-250/NAVSUP PUB 505)
1. THIS MESSAGE PROVIDES AMPLIFYING INFORMATION AND INSTRUCTIONS ON TRANSPORTATION OF LITHIUM BATTERIES VIA MILAIR. REFS A AND B PROVIDE AUTH FOR MILAIR TRANSPORT OF PROPERLY PACKAGED LITHIUM BATTERIES WITH EMBARKED PERSONNEL DURING TACTICAL/CONTINGENCY EXERCISES.
2. THE BA-5590 LITHIUM BATTERY AND ITS "ORIGINAL" PACKAGING MEET DOT-E-7052 SPECIFICATIONS. THE "ORIGINAL" PACKAGING OF THE BA-5590 IS AS FOLLOWS: EA BA-5590 IN PLASTIC CASING INSIDE INDIVIDUAL BOX, TEN BATTERIES/BOXES PER CARTON, 2 CARTONS PER OUTSIDE CONTAINER. EITHER OF THE CONTAINER CONFIGURATIONS (10 OR 20 BATTERY), OR OTHER PACKAGING CONFIGURATION USING CONTAINERS MEETING (AS A MINIMUM) DOT-12B SPECIFICATIONS, MAY BE PRESENTED FOR TRANSPORT VIA MILAIR WITH OR WITHOUT EMBARKED PERSONNEL. IN ANY CONFIGURATION, THE OUTSIDE CONTAINER MUST BE APPROPRIATELY LABELED AND OTHER RESTRICTIONS OF REF C ADHERED TO.
3. IT IS NOT ENVISIONED THAT INDIVIDUAL COMM-ELECT DEVICES TRANSPORTED VIA MAC ACFT WOULD REQUIRE INSTALLATION OF BATTERIES PRIOR TO OR DURING FLT OPS IN LESS THAN ACTUAL (VICE TRNG/EXERCISE) OPERATIONS. ACCORDINGLY, THE REF B WAIVER'S BATTERY PACKAGING RESTRICTION (IAW DOT-E-7052) IS NOT CONSIDERED OVERLY RESTRICTIVE.
4. IN THE CASE OF USMC TACTICAL AIR OPS, HOWEVER, PREPARATION OF COMM-ELECT DEVICES FOR OPERATION PRIOR TO EMBARKATION AND SUBSEQUENT TRANSPORT OF THOSE DEVICES WITH BATTERIES INSTALLED MAY BE REQUIRED. THE FOLLOWING GUIDELINES (AMPLIFYING THOSE OF REF C) ARE PROVIDED FOR THOSE INSTANCES WHERE ALTERNATIVE (NON-LITHIUM) BATTERIES ARE NOT AVAIL (FOR EXAMPLE, BB-590 FOR AN/PRC-104 RADIOS). NOTE: ALTERNATIVE BATTERIES MUST BE MADE AVAIL FOR COMSEC EQUIP (SEE PARA 4.E BELOW).
A. ONLY THOSE DEVICES REQUIRING IMMEDIATE LANDING ZONE UTILIZATION SHALL HAVE LITHIUM BATTERIES INSTALLED.
B. IDEALLY, ONLY NEW LITHIUM BATTERIES SHOULD BE INSTALLED IN EQUIP. HOWEVER, SHOULD THE OPERATIONAL SCENARIO DENY AVAILABILITY OF NEW BATTERIES, THE FRESHEST BATTERIES AVAILABLE MAY BE UTILIZED.
CAUTION: THE RELATIVE SAFETY OF USED (VS NEW) LITHIUM BATTERIES REMAINS UNDETERMINED. ACCORDINGLY, THE INSTALLATION OF USED LITHIUM BATTERIES WILL BE AT THE DISCRETION OF THE LOCAL COMMANDER AND THE AFFECTED AIRCRAFT COMMANDER/LOADMASTER ADVISED OF THE (POTENTIAL) INCREASED HAZARD/RISK.
C. PRIOR TO EMBARK, THE EQUIP WITH LITHIUM BATTERIES INSTALLED MAY BE OP-CHECKED, THEN IMMEDIATELY TURNED OFF. WHEN PRACTICABLE, THE EQUIP SHOULD BE CHECKED 45-60 MINUTES PRIOR TO EMBARK TO ALLOW TIME FOR THE CHEMICAL PROPERTIES OF THE BATTERIES TO STABILIZE.
D. PRIOR TO AND DURING EMBARK, THE TEAM/ACFT COMMANDER WILL PHYSICALLY INSPECT EACH DEVICE WITH LITHIUM BATTERIES INSTALLED TO ENSURE THAT THE DEVICE IS TURNED OFF.
E. TO THE EXTENT ALLOWABLE BY AIRFRAME CONFIGURATION AND THE OPNL SCENARIO, DEVICES WITH LITHIUM BATTERIES INSTALLED WILL BE STAGED WITHIN THE AIRFRAME IN A LOCATION WHICH IS PHYSICALLY SEGREGATED FROM THE AIRCREW/EMBARKED PERSONNEL AND WHICH ALLOWS JETTISONING OF EQUIP IN CASE OF EMERGENCY. THE POSSIBILITY OF HAVING TO JETTISON EQUIP/BATTERIES PRECLUDES INSTAL OF LITHIUM BATTERIES IN COMSEC EQUIP DURING FLT OPS
5. THE PRECEEDING AUTH AND PROCEDURES APPLY ONLY TO AIRLIFT OF NEW/UNUSED LITHIUM BATTERIES IN ORIGINAL OR SUBSTITUTE SHIPPING CONTAINERS, THE AIRLIFT OF EQUIP WITH NEW BATTERIES INSTALLED WHEN REQUIRED BY THE OPERATIONAL SCENARIO, AND THE AIRLIFT OF EQUIP WITH THE FRESHEST USED BATTERIES AVAIL WHEN THE OPERATIONAL SCENARIO DENIES AVAILABILITY OF NEW BATTERIES.
6. ERADCOM HAS INITIATED A STUDY OF USED/DEPLETED LITHIUM BATTERY PROPERTIES/HAZARD LEVELS. UNTIL POSITIVE STUDY RESULTS ARE PROVIDED, THE PRECEEDING AUTH/PROCEDURES DO NOT APPLY TO THE AIRLIFT (INTERNAL LOAD) OF OTHER USED OR DEPLETED LITHIUM BATTERIES IN SITUATIONS SHORT OF ACTUAL (VICE TRNG/EXERCISES) OPERATIONS REQUIRING EMERGENCY AIR TRANSPORT OF SUCH BATTERIES. HOWEVER, IN TRAINING/EXERCISE SITUATIONS WHEREIN ALTERNATIVE POWER SOURCES ARE NOT AVAIL/APPROPRIATE AND RETROGRADE OF USED/DEPLETED LITHIUM BATTERIES IS NOT POSSIBLE VIA SURFACE TRANSPORT, THE BATTERIES MAY BE EXTRACTED IN AN EXTERNAL LIFT CONFIGURATION BENEATH USMC TRANSPORT/UTILITY ROTARY-WINGED ACFT. THE FOLLOWING PROCEDURES WILL BE ADHERED TO:
A. EXTERNAL LIFTS SHALL BE PLANNED TO TERMINATE AT THE NEAREST LANDING ZONE OFFERING ONWARD TRANSPORT OF USED/DEPLETED BATTERIES VIA SURFACE TRANSPORT.
B. BATTERIES MUST BE SECURELY PACKAGED IN STRONG OUTSIDE CONTAINERS, PREFERRABLY METAL, WITH ALL CONTAINERS HAVING A PRESSURE RELEASE/VENTING SYSTEM OR CAPABILITY AND WITH EACH CONTAINER APPROPRIATELY AND CONSPICUOUSLY MARKED.
C. ALL PERSONNEL INVOLVED IN THE LIFT PROCESS, I.E. AIRCREW AND HELO SPT TEAM PERSONNEL AT BOTH DEPARTURE AND RECEPTION LANDING ZONES, MUST BE FULLY BRIEFED ON THE SPECIAL NATURE OF THE CARGO. RECEPTION ZONE PERSONNEL MUST ALSO BE BRIEFED ON SPECIAL HANDLING/STORAGE CONSIDERATIONS.
D. THE FLIGHT CREW WILL INVOKE AND FOLLOW ALL NATOPS PROCEDURES FOR SAFE FLIGHT PERTAINING TO EXTERNAL LIFTS OF HAZARDOUS CARGO.
7. HQMC POC IS LTCOL W. N. LOWE, LMA-3, (A) 224-2039 BT

CMC WASH DC 9
ACTION L(5) (D,6)
INFO A(1) CC(1) POC(1) TFK CK(1)

MCN=83101/13777 TOR=83101/1957Z TAD=83101/1958Z CDSN=MAX046

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE ZYUW RUEACMC3531 1011954
R 111402Z APR 83
FM CMC WASHINGTON DC
TO HQ AFLC WRIGHT-PATTERSON AFB OH//LOZP//
CG FMFLANT
CG FMFPAC
CGMCDEC QUANTICO VA
COMCABEAST CHERRY PT NC
CG FOURTH MAW
CG FOURTH MARDIV
CG MCLB ALBANY GA
COMCABWEST EL TORO CA
CG FOURTH FSSG
CG MCLB BARSTOW CA
INFO CDRCECOM FT MONMOUTH NJ //DRSEL-SF-ME//
CDRERADCOM FT MONMOUTH NJ //DELET-PB//
CDRERADCOM ADELPHI MD //DRDEL-SS//
COMNAVSEASYSCOM WASHINGTON DC

UNCLAS //N04030//
SUBJ: TRANSPORTATION OF LITHIUM BATTERIES ABOARD MAC AIRCRAFT (CMC CODE LMA-3)
A. HQ AFLC WPAFB OH 031215Z FEB 83 (NOTAL)
B. DOT-E-7052 (ELEVENTH REVISION)
C. CG FMFLANT 211500Z MAR 83 (NOTAL)
1. REF A PROVIDED WAIVER AUTHORIZING SHIPMENT OF LITHIUM BATTERIES, PACKED IAW REF B, ABOARD MAC PAX ACFT. REF C SOLICITED ASSISTANCE IN OBTAINING WAIVER AUTHORIZING ALTERNATIVE PACKAGING MATERIALS AND/OR CONTAINERS.
2. OUR INTERPRETATION OF DOCUMENTATION ON THE LITHIUM BATTERY BA-5590 IS THAT THE BATTERY IS MANUFACTURED, TESTED AND PACKAGED TO COMPLY WITH THE PROVISIONS AND MEASURES CONTAINED IN PARA'S 7A/C/D/E/F AND 8E OF REF B. OUR INTERPRETATION HAS BEEN CONFIRMED BY THE CECOM AND ERADCOM BATTERY DEVELOPMENT AND SAFETY OFFICES. ACCORDINGLY, IT IS OUR POSITION THAT BA-5590'S MAY BE SHIPPED VIA MILAIR IN THEIR ORIGINAL CONTAINERS OR SUBSTITUTE CONTAINERS MEETING DOT-12B SPECIFICATIONS. THIS PACKAGING IS SIGNIFICANTLY LESS RESTRICTIVE THAN A REQUIREMENT FOR PACKAGING IAW DOT-17H/C SPECS WHICH WOULD BE INVOKED FOR LITHIUM BATTERIES NOT MEETING THE REF B MANUFACTURING AND TESTING REQUIREMENTS. NOTE: THE PACKAGING OF ODD-LOTS OF NEW LITHIUM BATTERIES IN WOODEN CRATES OR AMMO CANS, AS NOTED IN REF C, WOULD MEET DOT-12B REQUIREMENTS.
3. FOR AFLC. YOUR CONCURRENCE WITH OUR POSITION IS REQUESTED. FURTHER, IT IS REQUESTED THAT A "LITHIUM BATTERIES IN ORIGINAL PACKAGING OR ALTERNATIVE PACKAGING IN STURDY WOODEN/METAL CONTAINERS" AUTHORIZATION BE TRANSMITTED TO MAC PERSONNEL/CARGO TERMINALS TO PRECLUDE POSSIBLE MISINTERPRETATION OF REF B REQUIREMENTS, I.E. DOT-17H/C VICE DOT-12B PACKAGING REQUIRED.
4. FOR USMC ADDEES. THE REF A WAIVER AND PRECEEDING PACKAGING INFO PERTAINS ONLY TO SHIPMENT OF NEW/UNUSED BA-5590 LITHIUM BATTERIES ABOARD MAC AIRCRAFT, EITHER "CARGO ONLY" OR WITH PERSONNEL. AIR SHIPMENT OF USED/DEPLETED LITHIUM BATTERIES IN MILITARY ACFT REMAINS PROHIBITED. FURTHER, THE WAIVER FOR SHIPMENT OF LITHIUM BATTERIES IN MAC PAX ACFT SHOULD BE EXERCISED ONLY WHEN SHIPMENT IN A "CARGO ONLY" CONFIGURATION IS NOT AVAILABLE TO MEET OPERATIONAL REQUIREMENTS.
5. HQMC POC IS LTCOL W. N. LOWE, LMA-3, (A) 224-2039. BT

CMC WASH DC
ACTION L(5) (D,6) 7
INFO POC(1) TFK CK(1)

MCN=83101/13729 TOR=83101/1954Z TAD=83101/1954Z CDSN=MAB635

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE ZYUW RUEACMC1123 0942234
R 301405Z MAR 83
FM CMC WASHINGTON DC
TO HQ DPDS BATTLE CREEK MI//DPDS-HEA//
INFO DGSC RICHMOND VA COMNAVFACENGCOM ALEXANDRIA VA
COMNAVSUPSYSCOM WASHINGTON DC HQ DA WASHINGTON DC//DALO-SM//
CDRCECOM FT MONMOUTH NJ //DRSEL-SF-MS/DRSEL-SF-ME//
HQ AFLC WRIGHT-PATTERSON AFB OH//LOLP//
DIR MAT MGT MCCLELLAN AFB CA//MMIR//
COMDT COGUARD WASHINGTON DC
CDRDARCOM ALEXANDRIA VA //DRCRE//
CDRERADCOM ADELPHI MD //DRDEL-SS//
DLA CAMERON STA VA//DLA-SM// CG FMFLANT
CG FMFPAC CG LFTCLANT NORFOLK VA
CG FOURTH FSSG MCCES TWENTYNINE PALMS CA
MARBKS GUANTANAMO BAY CUBA AIG EIGHT
XMT CG MCRD PARRIS ISLAND SC CG MCRD SAN DIEGO CA
HQBN HQMC ARLINGTON VA MARBKS WASHINGTON DC
FIRST MARCORDIST GARDEN CITY LI NY
MARFINCEN KANSAS CITY MO

UNCLAS //N02900//
SUBJ: ACCOUNTABILITY FOR AND PHYSICAL CUSTODY OF LITHIUM SULFUR DIOXIDE (LISO2) BATTERIES (CMC CODE LMA-3/LMM-2)
A. HQ DPDS BATTLE CREEK MI 101349Z FEB 83 (NOTAL)
1. THE REF PROVIDES DPDS POLICY ON THE SUBJ. WE CONCUR IN THE REF'S POLICY REGARDING:
A. REQUIRED BATTERY IDENTIFICATION/CERTIFICATION INFORMATION (BALANCED VS UNBALANCED CELL BATTERIES).
B. PACKAGING OF BATTERIES FOR TURN-IN (SEE PARA 5 BELOW FOR ADDITIONAL INFO).
C. REQUIREMENT FOR DPDO'S TO POSSESS CONFORMING (OR MOST-NEARLY-CONFORMING) STORAGE CAPABILITIES TO ACCEPT PHYSICAL CUSTODY OF LITHIUM BATTERIES.
2. FURTHER, WE CONCUR IN THE REF'S POLICY REGARDING CONTINUED USER RESPONSIBILITY FOR PHYSICAL CUSTODY (ACCOUNTABILITY TO DPDO) OF UNBALANCED CELL LITHIUM BATTERIES. HOWEVER, OUR CONCURRENCE IN THIS ITEM IS PREDICATED UPON THE IMMINENT DPDS ISSUANCE OF A CONTRACT WHICH WILL EFFECT NEAR-TERM PICK-UP OF UNBALANCED CELL BATTERIES FROM CURRENT USMC HOLDERS. IF BATTERIES ARE NOT TO BE PICKED UP BY 30 JUNE 83, OUR COMMENT IN PARA 4 BELOW PERTAINS.
3. WE DO NOT CONCUR IN THE REF'S IMPLIED POLICY REGARDING NON-ACCEPTANCE OF ACCOUNTABILITY IF THE DPDO DOES NOT POSSESS CONFORMING OR MOST-NEARLY-CONFORMING STORAGE CAPABILITIES. NOR DO WE CONCUR IN REF'S STATEMENT THAT, FOR DPDO'S TO ACCEPT ACCOUNTABILITY AND PHYSICAL CUSTODY, "THE BATTERIES MUST BE NON-LEAKING AND SAFE TO HANDLE".
4. IT IS OUR POSITION THAT DPDO'S AND OFF-SITE-BRANCHES SHOULD ACCEPT ACCOUNTABILITY FOR ALL LITHIUM BATTERIES REQUIRING DISPOSAL, REGARDLESS OF BATTERY CONDITION, AND THAT THE RESPONSIBILITY FOR PHYSICAL CUSTODY OF DAMAGED/PHYSICALLY ALTERED LITHIUM BATTERIES SHOULD BE ASSIGNED IN THE SAME MANNER AS THAT FOR "SAFE" LITHIUM BATTERIES, I.E. TO THE AGENCY/OFFICE HAVING CONFORMING OR MOST-NEARLY-CONFORMING STORAGE CAPABILITIES. RATIONABLE:
A. THAT CONTROLLED DISPOSAL OF LITHIUM BATTERIES (HAZARDOUS MATERIAL) IS REQUIRED AND MOST EFFICIENTLY PERFORMED VIA DPDS CHANNELS.
B. THAT CONTROLLED STORAGE OF DEPLETED LITHIUM BATTERIES (PENDING DISPOSAL) IS REQUIRED AND THAT, AT ANY GIVEN FACILITY, THE STORAGE LOCATION SHOULD BE THE ONE BEST QUALIFIED UNDER CONFORMING OR MOST NEARLY CONFORMING GUIDELINES.
C. THAT DAMAGED/PHYSICALLY ALTERED LITHIUM BATTERIES, WHEN APPROPRIATELY PACKAGED (SEE PARA 5 BELOW), ALSO REQUIRE DISPOSAL AND QUALIFY FOR TEMPORARY STORAGE (PENDING DISPOSAL) AT THE SELECTED CONFORMING OR MOST-NEARLY-CONFORMING STORAGE SITE.
D. THAT CONFORMING OR MOST-NEARLY-CONFORMING STORAGE SITES MAY, DEPENDING UPON THE FACILITY IN QUESTION, BE UNDER THE CONTROL OF THE TENANT DPDO OR OFF-SITE-BRANCH.
5. PACKAGING LITHIUM BATTERIES FOR TEMPORARY STORAGE, PENDING DISPOSAL:
A. WE ARE ADVISING OUR LITHIUM BATTERY USERS TO REPACKAGE USED/DEPLETED LITHIUM BATTERIES IN THEIR ORIGINAL SHIPPING CONTAINERS (OR SIMILAR, STURDY CONTAINERS) FOR TURN-IN. THE STURDY CONTAINERS WILL PROVIDE MORE BATTERY PROTECTION FOR INCIDENTAL HANDLING AND LOCAL TRANSPORT TO THE STORAGE/DISPOSAL SITE. THE CONTAINERS WILL ALSO FACILITATE ORDERLY STACKING AND INVENTORY CONTROL AT THE STORAGE SITE.
B. AS TO DAMAGED/PHYSICALLY ALTERED LITHIUM BATTERIES, WE BELIEVE THAT THE FOLLOWING PACKAGING AND TEMPORARY STORAGE PROCEDURES WILL ALLOW SAFE HANDLING OF SUCH BATTERIES IN THE DISPOSAL PROCESS:
(1) DAMAGED BATTERIES ARE TO BE ALLOWED TO STABILIZE FOR A MINIMUM OF FOUR HOURS PRIOR TO HANDLING/PACKAGING (BATTERIES MUST BE COOL TO TOUCH).
(2) EACH BATTERY IS TO BE SECURELY SEALED WITHIN A NON-POROUS AND TIGHTLY SEALED PLASTIC BAG TO PREVENT ESCAPE OF OR ACCESS TO BATTERY ELEMENTS/COMPOUNDS. IF THE BATTERY HAS SHARP PROTRUSIONS WHICH MIGHT DESTROY THE PLASTIC SEAL, THE BATTERY SHALL BE PLACED IN A CARTON AND THE CARTON SEALED IN A PLASTIC BAG.
(3) PLASTIC ENCASED BATTERIES ARE TO BE SECURELY PACKAGED WITHIN STURDY CONTAINERS HAVING A VENT CAPABILITY, WITH THE CONTAINERS APPROPRIATELY MARKED AS CONTAINING DAMAGED BATTERIES.
(4) CONTAINERS MAY BE STORED WITH BUT SHOULD BE STACKED SEPARATELY FROM "UNDAMAGED" LITHIUM BATTERIES OR OTHER COMBUSTIBLE MATERIAL, PREFERABLY IN A CONTROLLED, DRY, WELL VENTILATED AREA.
6. REQUEST ADVISE ON ACCEPTABILITY OF OUR POSITION RE: DPDO/OFF-SITE-BRANCH ACCOUNTABILITY FOR ALL LITHIUM BATTERIES REQUIRING DISPOSAL, PHYSICAL CUSTODY RESPONSIBILITY IAW CONTROL OF CONFORMING/MOST NEARLY CONFORMING STORAGE CAPABILITY, AND PACKAGING/STORAGE PROCEDURES FOR DAMAGED/PHYSICALLY ALTERED BATTERIES. FURTHER, REQUEST ADVISE ON PROJECTED CAPABILITY TO EFFECT PICK-UP OF UNBALANCED LITHIUM BATTERIES BY 30 JUNE 83.
7. YOUR EXPEDITIOUS RESPONSE TO THE ABOVE WILL BE APPRECIATED; HQMC POC IS LTCOL W. N. LOWE, LMA-3, (A) 224-2039. BT

CMC WASH DC
ACTION L(5)
INFO CC(1) POC(1) TFK CK(1)

8
(D,6)

MCN=83094/15030 TOR=83094/2225Z TAD=83094/2234Z CDSN=MAB213

SECTIONAL MESSAGE

UNCLASSIFIED

SECTIONAL MESSAGE

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE ZYUW RUEACMC8713 0880457
R 281402Z MAR 83
FM CMC WASHINGTON DC
TO CG FMFLANT CG FMFPAC
CG LFTCLANT NORFOLK VA CG FOURTH FSSG
MCCES TWENTYNINE PALMS CA MARBKS GUANTANAMO BAY CUBA
AIG EIGHT
XMT CG MCRD PARRIS ISLAND SC CG MCRD SAN DIEGO CA
HQBN HQMC ARLINGTON VA MARBKS WASHINGTON DC
FIRST MARCORDIST GARDEN CITY LI NY
MARFINCEN KANSAS CITY MO

UNCLAS //N04400// SECTION 01 OF 02
SUBJ: LITHIUM BATTERY STORAGE GUIDELINES (CMC CODE LMA-3/LMM-2/LFF-2)
A. HQ DPDS BATTLE CREEK MI 101349Z FEB 83 (NOTAL)
1. GENERAL:
A. LITHIUM BATTERIES, EITHER FRESH OR USED/DEPLETED, ARE NOT TO BE PIERCED, CRUSHED, BURNED, INTENTIONALLY DROPPED, CANNIBALIZED, DISMANTLED, MODIFIED, OR OTHERWISE CARELESSLY HANDLED, NOR SHALL THEY BE SHORT CIRCUITED, CHARGED OR USED IN ANY WAY OTHER THAN THEIR INTENDED USE.
B. ALTHOUGH LITHIUM BATTERIES ARE CLASSIFIED AS FLAMMABLE SOLIDS BY THE DEPT. OF TRANSPORTATION, THE POTENTIAL FOR A FIRE TO START IN THE PACKAGED ITEM IS CONSIDERED THE SAME AS FOR ORDINARY COMBUSTIBLE MATERIALS. HOWEVER, IF INVOLVED IN A FIRE, THE CLASSIFICATION FOR EXTINGUISHMENT PURPOSES WOULD BE "EXTRA HAZARD".
2. STORAGE AREA/FACILITY:
A. REFRIGERATED STORAGE IS NOT REQUIRED.
B. THE STORAGE AREA SHOULD HAVE ADEQUATE VENTILATION TO PREVENT BUILD-UP OF FUMES FROM ANY VENTING/LEAKING BATTERIES AND ALLOW AVOIDANCE OF TEMPERATURES EXCEEDING 130 DEGREES FAHRENHEIT.
C. THE STORAGE AREA SHALL BE IN A FLAMMABLE/HAZARDOUS STOREHOUSE WITH SPRINKLER PROTECTION, IF AVAILABLE. A FLAMMABLE/HAZARDOUS STOREHOUSE WITHOUT SPRINKLERS WILL BE THE SECOND CHOICE. OUTSIDE STORAGE IN A GENERAL STORAGE SHED OR IN VENTILATED LOCKERS IN A LIMITED ACCESS AREA ARE ALSO OPTIONS IF STACKED/STORED BATTERIES WOULD NOT BE SUBJECTED TO TEMPERATURES EXCEEDING 130 DEGREES FAHRENHEIT. ADDITIONALLY, A GENERAL PURPOSE WAREHOUSE MAY BE USED TEMPORARILY IF NONE OF THE PRECEEDING TYPES OF STORAGE FACILITIES ARE AVAIL AT THE TIME STORAGE IS REQUIRED. HOWEVER, OTHER COMBUSTIBLE MATERIAL AND OTHER MORE HAZARDOUS COMMODITIES SHALL NOT BE STORED IN THE SAME FIRE AREA AS THE BATTERIES WHEN THE AREA IS NOT SPRINKLER PROTECTED.
D. SMOKING SHALL BE STRICTLY PROHIBITED AND "NO SMOKING" SIGNS POSTED CONSPICUOUSLY IN BATTERY STORAGE AREAS. THE USE OF OPEN FLAME DEVICES SHALL BE RESTRICTED TO OPERATIONS UNDER PROPER SUPERVISION AND WITH ADEQUATE FIRE PREVENTIVE SAFEGUARDS.
E. ALL LITHIUM BATTERY STORAGE AREAS SHALL BE EQUIPPED WITH A CLASS D" EXTINGUISHER, PREFERRABLY LITH-X-TYPE. IN THE EVENT THAT A CLASS D" IS NOT AVAILABLE FOR ANY REASON, A WATER EXTINGUISHER MAY BE USED; IN SUCH CASES, EFFORT SHOULD BE AIMED AT PREVENTING THE SPREAD OF FIRE TO OTHER COMBUSTIBLES AND NOT DIRECTED ON THE BURNING LITHIUM CELLS.
F. AIR RESPIRATORS OR SELF-CONTAINED BREATHING APPARATUS APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH) SHALL BE WORN WHEN ENTERING STORAGE SPACES WHERE LITHIUM BATTERIES ARE VENTING OR HAVE VENTED.
3. STORAGE/PACKAGING PROCEDURES.
A. IN ANY FACILITY, STACKS OF LITHIUM BATTERIES SHALL BE LIMITED TO 2000 SQ. FT. IN AREA WITH THE WIDTH OF THE STORAGE UNIT NOT MORE THAN 25 FT. AISLES BETWEEN STACKS SHALL BE 8 FT OR ONE-HALF THE STACK HEIGHT, WHICHEVER IS GREATER. A MINIMUM OF 2 FT CLEARANCE SHALL BE MAINTAINED BETWEEN STACKS AND ANY WALL. A 3 FT CLEARANCE SHALL BE MAINTAINED BETWEEN A STACK AND ANY FIRE DOOR OPENING. A VERTICAL CLEARANCE OF 3 FT SHALL BE MAINTAINED BETWEEN THE TOP OF STACKS AND SPRINKLER HEADS OR CEILING/ROOF CONSTRUCTION IN UNSPRINKLERED FACILITIES.
B. NO OTHER MATERIAL OR COMMODITY WILL BE STORED IN THE SAME STACK WITH THE BATTERIES.
C. NEW LITHIUM BATTERIES SHOULD BE STORED IN THEIR ORIGINAL SHIPPING CONTAINERS. IN-SO-FAR AS IS POSSIBLE, UNITS USING LITHIUM BATTERIES SHOULD SAVE THE SHIPPING CONTAINERS FOR REPACKAGING USED/DEPLETED LITHIUM BATTERIES TO FACILITATE TRANSPORT AND/OR TEMP STORAGE PRECEEDING REUSE/DISPOSAL.
D. IF ORGINAL SHIPPING CONTAINERS ARE NOT AVAILABLE, USED AND DEPLETED LITHIUM BATTERIES MAY BE REPACKAGED AND STORED (PENDING FURTHER USE OR DISPOSAL, RESPECTIVELY) IN SIMILAR WOODEN OR STRONG FIBERBOARD BOXES WHICH MEET DOT 12B SPECIFICATIONS. IF METAL CONTAINERS ARE USED, THEY MUST HAVE AN OVER-PRESSURE/VENT CAPABILITY.
NOTE: REF A AUTH TURN-IN OF LITHIUM BATTERIES (FOR DISPOSAL) IN PLASTIC BAGS. HOWEVER, BECAUSE SURFACE TRANSPORT IS INVOLVED IN THE TURN-IN PROCESS, PACKAGING THE DEPLETED BATTERIES SECURELY WITHIN STRONG CONTAINERS IS CONSIDERED TO BE A PRUDENT APPROACH.
E. CONTAINERS OF USED OR DEPLETED BATTERIES ARE TO BE APPROPRIATELY AND CONSPICUOUSLY MARKED/LABELED AS PRESCRIBED IN SUBPART "D" AND "E" OF 49CFR. FOR EXAMPLE, DOT "FLAMMABLE SOLID" MARKING AND THE WORDS CONTAINS LITHIUM METAL".
F. CONTAINERS OF USED OR DEPLETED LITHIUM BATTERIES ARE NOT TO BE PLACED IN THE SAME STACKS AS NEW BATTERIES OR OTHER COMBUSTIBLE MATERIAL.
G. DEPLETED LITHIUM BATTERIES ARE NOT TO BE ALLOWED TO ACCUMULATE AT USING UNITS; DISPOSAL SHOULD BE EFFECTED AS PROMPTLY AS POSSIBLE, I.E. A TARGET LIMIT FOR TEMP STORAGE SHOULD BE A MAXIMUM OF 30 POUNDS OR 30 DAYS. A COLLECTION POINT/STORAGE AREA SEPARATE FROM NEW/USED BATTERIES AND OTHER COMBUSTIBLE MATERIAL SHALL BE ESTABLISHED FOR BATTERIES AWAITING DISPOSAL. LITHIUM BATTERIES ARE NOT TO BE DISPOSED OF NOR TRANSPORTED WITH NORMALLY GENERATED REFUSE. BT

CMC WASH DC 23
ACTION L-S(11) (I,M)
INFO CC-S(10) POC-S(1) TFK CK-S(1)

SECTIONAL MESSAGE

UNCL

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MES

ROUTINE ZYUW RUEACMC8714 0880457
R 281402Z MAR 83
FM CMC WASHINGTON DC
TO CG FMFLANT CG FMFPAC
CG LFTCLANT NORFOLK VA CG FOURTH FSSG
MCCES TWENTYNINE PALMS CA MARBKS GUANTANAMO BAY CUBA
AIG EIGHT
XMT CG MCRD PARRIS ISLAND SC CG MCRD SAN DIEGO CA
HQBN HQMC ARLINGTON VA MARBKS WASHINGTON DC
FIRST MARCORDIST GARDEN CITY LI NY
MARFINCEN KANSAS CITY MO

UNCLAS //N04400// FINAL SECTION OF 02
4. HQMC POC IS LTCOL W. N. LOWE, LMA-3, (A) 224-2039. BT

MCN=83088/07134 TOR=83088/0441Z TAD=83088/0546Z CDSN=MAX382

UNCLASSIFIED

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE ZYUW RUEACMC2977 0710145
R 101402Z MAR 83
FM CMC WASHINGTON DC
TO CG FMFLANT
INFO CG FMFPAC CGMCDEC QUANTICO VA

UNCLAS //N04400//
FOR G4
SUBJ: LITHIUM BATTERY STATUS (CMC CODE LMA-3)
A. CG FMFLANT 091353Z FEB 83
B. CG FMFLANT 281418Z FEB 83
C. CMC WASHINGTON DC 041404Z MAR 83
D. CMC WASHINGTON DC 071402Z MAR 83
E. CMC WASHINGTON DC 151405Z FEB 83
1. REF A PROVIDED A SUMMARY OF LITHIUM BATTERY TRANSPORT, DISPOSAL AND SAFETY/HANDLING CONSIDERATIONS. REF B REQUESTED DELETION OF PORTIONS (PARAS 4.F AND 4.H) OF REF A WHICH DISCUSSED FIRE PROCEDURES AND TEMP STORAGE OF DAMAGED LITHIUM BATTERIES; WE CONCUR IN THE RECOMMENDED CHANGES/DELETIONS.
2. IN ADDITION TO THE ABOVE, ADDEES SHOULD NOTE THE FOLLOWING (REFER TO REF A):
A. PARA 2A(3). WE ARE CURRENTLY STAFFING MORE DEFINITIVE INFO ON TRANSPORTING LITHIUM BATTERIES VIA USMC ACFT.
B. PARA 2B(3). NAVSEA CONCURRANCE FOR TRANSPORTING LITHIUM BATTERIES VIA SUBMARINE WILL BE SOLICITED FOLLOWING RECEIPT OF FMFLANT/PAC INPUT (SEE REF C).
C. PARA 2C(2). DOT-E-8441 HAS BEEN EXTENDED AND RESTRICTIONS/EXEMPTIONS ON TRANSPORTATION OF LITHIUM BATTERIES IN THE DISPOSAL PROCESS REMAIN IN EFFECT.
D. PARA 3.B. REFER TO REFS D AND E FOR LATEST INFO ON DISPOSAL ASHORE. PLEASE NOTE THAT AN UNBALANCED BA-5590 BATTERY WAS RECENTLY SHIPPED BY THE RED RIVER ARMY DEPOT TO A USMC UNIT: CECOM ASSISTANCE HAS BEEN REQUESTED TO PREVENT FURTHER OCCURANCES, BUT MARINE CORPS UNITS SHOULD BE ADVISED TO CHECK ALL INCOMING SHIPMENTS FOR ANY UNDESIRED "UNBALANCED" BATTERIES IDENTIFIED BY REF E.
E. PARAS 3B(1)(B) AND 3B(1)(C). WE HAVE OPENED DISCUSSIONS WITH NAVSEA AND NSWC/WHITE OAK ON THE EFFECTS OF INCINERATING LITHIUM BATTERIES. PENDING RECEIPT OF FAVORABLE DETERMINATIONS ON THE SUBJ, LITHIUM BATTERIES ARE TO BE DISPOSED OF ONLY THROUGH PHYSICAL TRANSFER INTO DPDO CHANNELS (LAND) OR DISPOSAL AT SEA IAW NAVSEAINST 9310.1A (SEE REF A PARA 3A). SEE REF D FOR INST ON REPORTING "UNSAFE" LITHIUM BATTERIES NOT ACCEPTABLE BY DPDO'S; EMERGENCY DESTRUCTION PROCEDURES ARE CURRENTLY UNDER DEVELOPMENT. THE PRECEEDING ALSO APPLIES TO THE PARA 3B(1)(C) COMMENT ON DISPOSAL BY BURYING IN A CONTROLLED HAZARDOUS WASTE LANDFILL.
F. PARA 4G. PENDING MORE SPECIFIC EPA/DPDS GUIDANCE, USMC LITHIUM BATTERIES ARE TO BE REFERRED TO AS "HAZARDOUS MATERIAL" VICE HAZARDOUS WASTE", REGARDLESS OF CONDITION (NEW/USED/DEPLETED/DAMAGED). MCO 4570.24A GERMANE.
G. PARA 4I. ALTHOUGH THE INFO PROVIDED PARALLELS THAT STATED IN THE DRAFT USMC LITHIUM BATTERY SAFETY ORDER, WE CURRENTLY BELIEVE THAT MORE STRINGENT HANDLING INSTRUCTIONS ARE REQUIRED, I.E.:
(1) TURN OFF THE EQUIPMENT AND MOVE PERSONNEL OUT OF THE IMMEDIATE AREA.
(2) ALLOW ONE HOUR FOR THE BATTERY TO COOL. IF THE BATTERY IS NOT COOL TO THE TOUCH MORE TIME MAY BE NECESSARY BEFORE REMOVING THE BATTERY FROM THE EQUIP.
(3) WHEN BATTERY IS COOL TO TOUCH, CAREFULLY REMOVE IT FROM THE EQUIP (USE OF GLOVES OR OTHER PROTECTION RECOMMENDED). PACKAGE THE FAULTY BATTERY IN AN INDIVIDUAL NON-POROUS CONTAINER/BAG AND OVERPACK THE CONTAINER TO PREVENT (FURTHER) PHYSICAL DAMAGE/MISHANDLING.
(4) IT THE BATTERY CANNOT BE REMOVED FROM THE EQUIP, PROVIDE LIKE PACKAGING/PROTECTION FOR THE EQUIP.
(5) SERREGATE THE BATTERY/EQUIP TO PREVENT UNDUE HANDLING OR HAZARD TO PERSONNEL AND REPORT THE INCIDENT/CIRCUMSTANCES IAW REF D.
3. PLEASE ENSURE THAT PRECEEDING INFO IS PROVIDED TO ALL RECIPIENTS OF REF A AND SUBSEQUENT READDRESSALS OF SAME. FURTHER REQUEST THAT INFO PERTINENT TO SUBORDINATE COMMANDS BE EXTRACTED FROM PARA 2 PROCEEDING AND TRANSMITTED TO THOSE COMMANDS FOR ACTION/INFO.
4. HQMC POC IS LTCOL W. N. LOWE, LMA-3, (A) 224-2039. BT

CMC WASH DC 10
ACTION L(7) (D,6)
INFO CC(1) POC(1) TFK CK(1)

MCN=83071/02080 TOR=83071/0145Z TAD=83071/0149Z CDSN=MAB508

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE ZYUW RUEACMC0943 0680508
R 071402Z MAR 83
FM CMC WASHINGTON DC
TO CG FMFLANT CGMCDEC QUANTICO VA
CG FMFPAC CG FOURTH MAW
CG FOURTH MARDIV CG MCLB ALBANY GA
CG MCAGCC TWENTYNINE PALMS CA CG MCLB BARSTOW CA
CG LFTCLANT NORFOLK VA CG FOURTH FSSG
MCCES TWENTYNINE PALMS CA MARKBS GUANTANAMO BAY CUBA
INFO CDRCECOM FT MONMOUTH NJ //DRSEL-SF-ME//
DPDS BATTLE CREEK MI //DPDS-HEA//
SCIAD FMFPAC CAMP PENDLETON CA

UNCLAS //N04400//
FOR : G4, SUPO, CEO
SUBJ: DISPOSAL OF LITHIUM BATTERIES (CMC CODE LMA-3)
A. HQ DPDS BATTLE CREEK MI 101349Z FEB 83 (PASEP)
B. HQ DPDS BATTLE CREEK MI 241300Z JAN 83 (NOTAL)
C. CMC WASHINGTON DC 151405Z FEB 83 (PASEP)
D. CG FMFLANT 091353Z FEB 83 (NOTAL)
1. REF A, WHICH SUPERCEDES REF B, PROVIDES FOR THE TURN-IN OF LITHIUM BATTERIES TO DPDO'S IN THE LITHIUM BATTERY DISPOSAL PROCESS. CONDITIONS WHICH MUST BE MET FOR THE SERVING DPDO, INCL OFF-SITE BRANCHES (OSB), TO TAKE PHYSICAL CUSTODY ARE:
A. BATTERIES MUST BE PROPERLY IDENTIFIED, BE OF BALANCED CELL DESIGN AND CERTIFIED AS SUCH, AND BE PROPERLY PACKAGED.
B. BATTERIES MUST BE SAFE TO HANDLE.
C. DPDO/OSB MUST HAVE "CONFORMING" STORAGE.
2. REF C PROVIDED INST ON TURN-IN OF "UNBALANCED" CELL LITHIUM BATTERIES. FURTHER, NO DIFFICULTIES SHOULD BE ENCOUNTERED IN PROVIDING THE REQUESTED BATTERY IDENTIFICATION/CERTIFICATION INFO OR PACKAGING FOR TURN-IN.
3. PENDING DEVELOPMENT/DISTRIB OF EMERGENCY DESTRUCTION PROCEDURES, TAKE ALL AVAILABLE STEPS TO SAFEGUARD PERSONNEL/EQUIP/FACILITIES FROM LITHIUM BATTERIES CONSIDERED UNSAFE (DAMAGED, LEAKING, ETC) AND NOT ACCEPTABLE FOR TURN-IN AND DISPOSAL VIA ROUTINE CHANNELS. REPORT THE CIRCUMSTANCES BY IMMED MSG TO THIS HQ (LMA-3); DISPOSITION INST WILL BE PROVIDED.
4. AVAILABILITY/POSSESSION OF CONFORMING AND/OR MOST NEARLY CONFORMING STORAGE FACILITIES, AND A CHECKLIST FOR DETERMINING SAME, WILL BE FORMALLY ADDRESSED BY A FORTHCOMING MCBUL OF THE 6280 SERIES. ACTIVITY COMMANDERS, WHO ARE RESPONSIBLE FOR HAZARDOUS MATERIAL MANAGEMENT, AND THE TENANT DPDO/DSB WILL UTILIZE THE CHECKLIST TO DETERMINE THE AVAILABILITY OF CONFORMING AND/OR MOST NEARLY CONFORMING STORAGE CAPABILITIES. THE FINAL DETERMINATION ON RESPONSIBILITY FOR STORAGE OF HAZARDOUS MATERIAL FOR DISPOSAL (I.E. DEPLETED LITHIUM BATTERIES) WILL BE MADE BY THE HOST FACILITY/ACTIVITY COMMANDER.
5. AS NOTED WITHIN REF C, HQ DPDS IS DEVELOPING A CONTRACT FOR NEAR-TERM PICK-UP/DISPOSAL OF BOTH BALANCED AND UNBALANCED CELL LITHIUM BATTERIES. DPDS WILL ALSO BE LETTING SUBSEQUENT CONTRACTS FOR CONTINUING/FUTURE LITHIUM BATTERY PICK-UP AND DISPOSAL. TO ASSIST IN THE DEVELOPMENT OF THIS/THESE FOLLOW-ON CONTRACT(S), PLEASE PROVIDE THE FOLLOWING INFORMATION TO THIS HQ (ATTN:LMA-3) BY 1 APRIL 83.
A. GEOGRAPHIC LOCATION/NAME OF ACTIVITY AND SERVING DPDO/OSB TO HAVE PHYSICAL CUSTODY OF AND/OR ACCOUNTABILITY FOR LITHIUM BATTERIES REQUIRING DISPOSAL.
B. BATTERY NOMENCLATURE AND NSN
C. ESTIMATED QTY PER MONTH OR OTHER SPECIFIED TIME PERIOD.
6. THE PRECEEDING DATA WILL BE CONSOLIDATED AND FORWARDED TO HQ DPDS BY THIS HQ. ENSURE THAT AFFECTED DPDO/OSB IS MADE AWARE OF PLANNING DATA PROVIDED.
7. REF D PROVIDED RESUME OF LITHIUM BATTERY USE/STORAGE/TRANSPORTATION/DISPOSAL PROBLEMS. WE SHARE FMF CONCERN AND CONTINUE IN OUR EFFORTS TO NEGATE OR ALLEVIATE THOSE PROBLEMS. SOLUTIONS TO INDIVIDUAL PROBLEMS WILL BE PROVIDED BY MESSAGE TO ALLOW IMMEDIATE APPLICATION; A SINGLE CMC DIRECTIVE WILL BE PUBLISHED IN THE NEAR FUTURE FOLLOWING RESOLUTION OF MAJOR PROBLEM AREAS.
8. HQMC POC IS LTCOL W. N. LOWE, LMA-3, (A)224-2039 BT

CMC WASH DC 5
ACTION L(4) (D,6)
INFO TFK CK(1)

MCN=83068/06315 TOR=83068/0458Z TAD=83068/0531Z CDSN=MAB649

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE ZYUW RUEACMC9896 0690414
R 081405Z MAR 83
FM CMC WASHINGTON DC
INFO CG FMFLANT
CGMCDEC QUANTICO VA
CG FOURTH MARDIV
CG LFTCLANT NORFOLK VA
CG MCAGCC TWENTYNINE PALMS CA
MCCES TWENTYNINE PALMS CA
CG FMFPAC
CG FOURTH MAW
CG MCLB ALBANY GA
CG FOURTH FSSG
CG MCLB BARSTOW CA
ZEN/MARBKS GUANTANAMO BAY CUBA
P 101349Z FEB 83
FM HQ DPDS BATTLE CREEK MI
TO CDR DPDR EUR LINDSEY AS GER//DPDR-ER//
DPDR MEMPHIS TN//DPDR-MR//
CDR DPDR PAC CAMP H M SMITH HI//DPDR-PR//
DPDR COLUMBUS OH//DPDR-CR//
DPDR OGDEN UT//DPDR-OR//
INFO DGSC RICHMOND VA//DGSC D//
NAVFACENGCOM WASH DC//CODE 1121A//
NAVSUPSYSCOM WASH DC//NAVSUP 04226//
HQ DA WASH DC//DALO-SM//
CDR CECOM FT MONMOUTH NJ//DRSEL SF MS//
HQ AFLC WP AFB OH//LOLP//
DIR MAT MGT MCCLELLAN AFB CA//MMIR//
CMC WASH DC//LMA 3//
COMDT CO GARD WASH DC
CDR DARCOM ALEXANDRIA VA//DRCRE//
CDR ERADCOM ADELPHI MD//DRDEL SS//
DLA CAMERON STA VA//DLA SM//

UNCLAS DPDS-HEA 0912. SUBJECT: PHYSICAL CUSTODY OF LITHIUM SULFUR DIOXIDE(LISO2) BATTERIES.
REFERENCE; DPDS-HEA MSG 241300Z JAN 83, SUBJECT AS ABOVE.
1. REFERENCE IS RESCINDED. THE FOLLOWING SUBJECT POLICY CHANGE REPLACES IT AND TAKES EFFECT UPON RECEIPT.
A. DPDO S WILL TAKE ACCOUNTABILITY AND PHYSICAL CUSTODY OF LITHIUM BATTERIES UNDER THE FOLLOWING CIRCUMSTANCES;
1. THOSE LITHIUM BATTERIES PROCURED BY THE ARMY FROM 1980 ON, WITH THE EXCEPTION OF ANY LITHIUM BATTERIES PROCURED UNDER CONTRACTS #DAAB07-78-D-6353, AND #DAAB-07-77-C-0464. (ACCOUNTABILITY BUT NOT PHYSICAL CUSTODY SHOULD BE TAKEN FOR THESE BATTERIES.) SPECIAL ATTENTION SHOULD BE GIVEN TO BATTERIES PROCURED UNDER CONTRACT #DAAB07-80-D-6504. BOTH UNBALANCED AND BALANCED CELL BATTERIES WERE PROCURED FROM THIS CONTRACT. (UNBALANCED BATTERIES ARE SUBJECT TO EXCESSIVE PRESSURE BUILDUP AND RUPTURE OF BATTERY CASING.) ANY BATTERIES PROCURED UNDER THIS LATTER CONTRACT WITH A MANUFACTURE DATE OF OCT 81(10/81) OR LATER, AND THAT HAVE AN "A" FOLLOWING THE SERIAL NUMBER ARE OF BALANCED CELL DESIGN. ACCOUNTABILITY AND PHYSICAL CUSTODY CAN BE TAKEN FOR THESE BATTERIES. HOWEVER, ACCOUNTABILITY BUT NOT PHYSICAL CUSTODY SHOULD BE TAKEN FOR BATTERIES MANUFACTURED UNDER THIS CONTRACT PRIOR TO OCT 81.
(2) THE BATTERIES FOR TURN IN ARE PROPERLY IDENTIFIED, TO INCLUDE A CERTIFICATION ON THE TURN-IN DOCUMENT BY THE TURN-IN ACTIVITY THAT THE BATTERIES ARE "BALANCED CELL BATTERIES".
(3) THE BATTERIES MUST BE NON-LEAKING AND SAFE TO HANDLE, IN THE ORIGINAL CONTAINER OF UNUSED ,OR IN FIBERBOARD BOXES OR PLASTIC BAGS IF USED.
(4) THE DPDO POSSESSES CONFORMING STORAGE AS DETERMINED BY USE OF THE CONFORMING STORAGE CHECKLIST.
(B) TO SUMMARIZE, UNDER NO CIRCUMSTANCES WILL THE DPDO TAKE PHYSICAL CUSTODY OF "UNBALANCED" BATTERIES, NSN 6135-01-036-3495, MANUFACTURED UNDER CONTRACTS #DAAB-07-77-C-0464 '(MALLORY) AND #DAAB07-78-D-6353 (POWER CONVERSION,INC.). NEITHER WILL DPDO S TAKE PHYSICAL CUSTODY OF "UNBALANCED" BATTERIES MANUFACTURED PRIOR TO OCT 81 UNDER CONTRACT # DAAB07-80-D-6504 (POWER CONVERSION,INC.). MANUFACTURE DATE AND CONTRACT NUMBER CAN BE USUALLY VERIFIED BY CHECKING THE MARKING ON THE BATTERIES(USED).
2. REQUEST THIS POLICY CHANGE BE DISSEMINATED TO DPDO S IMMEDIATELY. THIS POLICY CHANGE IS ADDRESSED IN THE BATTERY CHAPTER TO DPDS-M 6050.1, PRESENTLY IN PUBLICATION. BT

CMC WASH DC 7
ACTION L(5) (D,6)
INFO POC(1) TFK CK(1)

MCN=83069/05338 TOR=83069/0414Z TAD=83069/0415Z CDSN=MAC744

****
* UNCLASSIFIED *
****

ARLINGTON ANNEX
MESSAGE CENTER

ROUTINE ZYUW RUEACMC1621 0690039
R 0814037 MAR 83
FM CMC WASHINGTON DC
INFO CGMCDEC QUANTICO VA
CG FOURTH MAW
CG FOURTH MARDIV
CG MCLB ALBANY GA
CG LFTCLANT NORFOLK VA
CG FOURTH FSSG
CG MCAGCC TWENTYNINE PALMS CA
CG MCLB BARSTOW CA
O R 031215Z FEB 83
FM HQ AFLC WPAFB OH//LOZP//
TO CG FMFLANT
INFO CMC WASHINGTON DC
HQ MAC SCOTT AFB IL//TRKC/LNM//
HQ USAF WASH DC//LETT//
CG FMFPAC
CG SECOND MARDIV
CG SECOND MAW
CG FOURTH MAB
SECOND FSSG

UNCLAS //N04030//
SUBJECT: HAZARDOUS CARGO WAIVER FOR LITHIUM BATTEREIS ABOARD PAX ACFT.
REF: YOUR MSG 311852Z JAN 83
1. CLEARANCE IS GRANTED TO SHIP LITHIUM BATTERIES PREPARED FOR SHIPMENT ACCORDING TO DOT-E-7052 BY MILITARY AIRCRAFT. ALL OTHER REQUIREMENTS OF AFR 71-4 APPLY.
2. AFR 71-4/MCO P4030.19 PARAGRAPH 3-6 IS APPLICABLE FOR TACTICAL OR CONTINGENCY EXERCISES.
3. WAIVER NUMBER AFLC 71-4-83-8 APPLIES TO THESE SHIPMENTS. ANY INCIDENT MUST BE REPORTED TO THIS OFFICE AS SOON AS POSSIBLE. THIS WAIVER EXPIRES 29 FEB 1984. BT

CMC WASH DC 0
ACTION L(*)
INFO POC(*) TFK CK(*) (D,S)

TOTAL COPIES REQUIRED 0

MCN=83069/00791 TOR=83069/0039Z TAD=83070/2214Z CDSN=MPC147

DEPARTMENT OF THE NAVY

NAVAL SEA SYSTEMS COMMAND

WASHINGTON, D.C. 20362

IN REPLY REFER TO
04H32/HTH
Ser 491
8020

25 MAY 1982

From: Commander, Naval Sea Systems Command
To: Commandant of the Marine Corps (LMA-4)

Subj: Replacement Lithium Batteries for Marine Corps electronic equipment; Shipboard storage and handling aboard Amphibious type Surface Ships

Ref: (a) Headquarters USMC ltr LMA-4/REO-reo of 1 Feb 1982
(b) NAVSEASYSCOM ltr 04H132/HTH Ser 439 8020 of 6 Jul 1981

1. Reference (a) requested consideration be given to revising the guidance for shipboard storage and handling of replacement type lithium batteries as stated in reference (b). Reference (a) indicates that the guidance of paragraph 5.b. prohibiting the return aboard ship of used lithium batteries or lithium battery powered equipment with batteries installed, is unduly restrictive in view of the cost of the batteries and it creates a disposal problem ashore. In consideration of these facts the guidance presented by reference (b) has been revised.

2. The revised guidance is based on the following rationale: While cost is a factor in assessing the safety of an item, the prime factor in the decisions reached regarding The Marine Corps intended use of replacement type lithium batteries is that the hazard associated with lithium batteries increases after use. All known incidents involving venting of lithium sulfur dioxide batteries have occurred with batteries either in use, storage after use, or during repeated use. In considering shipboard storage of large quantities of replacement batteries precautions must be taken to protect against the effects of a venting occurring in a mass storage area. The optimum protection, from a shipboard safety point of view, is afforded by not allowing used batteries back aboard the ship. As noted in reference (a), this presents a problem in disposal at the site of use as well as a considerable operations cost. Therefore, the revised guidance presented below reflects a change in policy to allow once used lithium batteries and equipment containing such batteries back aboard ship for storage in jettisonable topside lockers for shipment back for either disposal or future employment. It is to be noted that accident data indicates that the hazard to personnel is greater when used lithium batteries are utilized. The following revised guidelines will replace those of reference (b).

3. New and unused lithium batteries may be stored on amphibious type surface ships either on the weather decks or below decks. In either storage location the quantity stored in an area shall be kept to the minimum consistent with requirements since the effect of mass storage on the hazard degree is not known. Weather deck storage is preferred and is to be utilized if at all possible. Specifically then for:

(a) Storage on the weather deck

(1) Lithium batteries shall be stored in their original shipping containers in a jettisonable type, drip proof, ventilated locker capable of maintaining the storage temperature below 130°F.

(2) The storage locker shall be isolated from other hazardous and combustible material and shall be used only for the storage of new and unused lithium batteries.

(b) Storage below the decks

(1) Lithium batteries shall be stored in their original shipping containers in a cool, sprinkler protected, ventilated area and the storage temperature shall be maintained below 130°F.

(2) The storage area shall be isolated from other hazardous and combustible material and shall be used only for the storage of new and unused lithium batteries. Isolation shall be provided utilizing equivalent barriers to those used to separate non-compatible stows of L form ammunition.

(3) Lithium batteries and lithium powered equipment with batteries installed shall not be stored in berthing areas.

4. Used or depleted lithium batteries shall only be stored on the weather decks. Below deck storage of used or depleted lithium batteries is prohibited. Specifically then for:

(a) Storage on the weather deck

(1) Used or depleted lithium batteries shall be stored in their original packaging containers in a jettisonable type, drip proof, ventilated locker, capable of maintaining the storage temperature below 130°F.

(2) The jettisonable locker shall be isolated from other hazardous items and combustible material and shall be used only for the storage of used or depleted lithium batteries or equipment with used lithium batteries installed.

5. Due to the increased hazard associated with use, handling and storage of depleted or used lithium batteries, the following shall apply:

a. Preparatory to the ashore employment of equipment using lithium batteries, the batteries may be mated to the equipment aboard ship in topside locations only. Shipboard equipment checks shall be held to a minimum and be performed in topside locations only.

04H32/HTH
Ser 491
8020

b. Upon completion of each ashore employment all used or depleted lithium batteries or equipment with lithium batteries installed, shall be stowed in jettisonable topside lockers.

c. All used or depleted lithium batteries shall be off-loaded at the earliest possible time, however, in no case shall they be off-loaded during ammunition or fueling evolutions.

6. It is requested that specific details be furnished this Command identifying specific ships, quantities of batteries for each and storage volume required. This information will be used in developing SHIPALTS to accommodate such storage.

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COMPHIBGRUEASTPAC
CMC (CCTO)
NAVSAFECEN (Code 332)

M. R. VAN SLYKE
By direction

DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
WASHINGTON, D C. 20362

IN REPLY REFER TO
NAVSEAINST 9310.1A
SEA 04H32/HTH
Ser 88
11 March 1982

NAVSEA INSTRUCTION 9310.1A

From: Commander, Naval Sea Systems Command
To: All Offices Reporting Directly to COMNAVSEA
Distribution List

Subj: Naval Lithium Battery Safety Program; responsibilities and procedures for

Ref: (a) NAVMATINST 5100.6A of 28 Feb 1980, subj: System Safety Program: implementation of
(b) MIL-STD-882A of 28 Jun 1977
(c) NAVMATINST 4030.11 of 2 Nov 1979, subj: Hazardous Material Packaging Certification; policies and procedures for

Encl: (1) Use, Packing, Storage, Transporting and Disposal of Lithium Batteries
(2) Safety and Performance Tests for Qualification of Lithium Batteries

1. Purpose. To establish and promulgate policy, responsibilities and guidelines for the design, acquisition, testing, evaluation, use, packaging, transportation, storage and disposal of lithium batteries and equipment powered by such batteries.

2. Cancellation. NAVSEAINST 9310.1 of 30 Mar 1979 is hereby cancelled and superseded.

3. Scope. This instruction is applicable to all Navy activities and to Marine Corps activities to the extent specified by the Commandant. Material to which this instruction applies includes lithium batteries and all equipment powered by lithium electrochemical power source(s) through all phases of the life cycle of such systems.

4. Background

a. The stringent performance requirements of present and future Naval battery powered systems necessitate the use of advanced lithium batteries with extended energy and life characteristics. In recent years, battery manufacturers in the United States and various foreign nations have been developing new lithium batteries using lithium metal anodes coupled with either carbon monofluoride (CF), sulfur dioxide (SO_2), thionyl chloride ($SOCl_2$) or other cathode materials. These batteries represent a major breakthrough as primary power sources and provide certain unique advantages over conventional electrochemical systems. The advantages are: (1) a substantial improvement in specific energy, (2) higher operating cell voltage, (3) low temperature operation and (4) projected long shelf life. While lithium batteries in general offer five to ten times the specific energy of conventional systems, each design differs from the other in its level of performance, range and scope and in their hazard

b. Lithium batteries should be considered hazardous at all times, especially under conditions of abuse, misuse, depletion or partial discharge. Incidents have been documented involving the venting of toxic gases, fires and explosions.

c. Knowledge of the chemistry of lithium batteries under all possible Fleet conditions is the key to the identification and control of related safety and environmental hazards, and is essential if efforts to overcome these hazards by battery design or by logistics management and control are to succeed. The highly energetic and reactive nature of lithium batteries requires that safeguards be employed in their design, fabrication, procurement, packaging, handling, transportation, use, storage and disposal. In general, manufacturers are aware that under certain conditions lithium batteries may be unsafe and most manufacturers have incorporated safety devices such as: (1) pressure relief mechanisms, (2) fuses to protect against overload and (3) diodes to prevent cell reversal or charging. The reliability of these safety devices in many cases is dependent on the environment in which the battery is used, as well as the mode of operation.

5. Policy

a. It is the policy of the Chief of Naval Material and the Commander, Naval Sea Systems Command that full consideration and timely attention will be given to matters concerned with lithium battery safety. All lithium batteries and every system (end item) using a lithium battery must be reviewed, tested and approved in accordance with enclosures (1) and (2) before the system shall be permitted to advance to the next stage of development and before test, prototype or production units are introduced to the Fleet. The Naval Surface Weapons Center (NAVSWC), under the direction of SEA 04H, will act as lead laboratory in performing this function.

b. Due to the hazard potential in use and the ecological aspects of disposal, lithium batteries may be used only when it is established that no other battery will provide adequate performance to meet an operational requirement. Only lithium batteries which have been approved for a specific application shall be procured for fleet use and then solely for that application. The Systems Command having cognizance of the development or acquisition is responsible for issuing such approval for service use. A technical safety evaluation of the battery and its intended use shall be the basis for the approval decision.

6. Responsibilities

a. The Commander, Naval Sea Systems Command (SEA 04H): as the designated technical authority for lithium battery safety within the Naval Material Command, per CHNAVMAT ltr 04F4/HAM of 12 September 1977, will direct and coordinate efforts of all technical offices in regard to lithium battery safety, provide technical guidance and act authoritatively for the Naval Material Command in such matters; and serve as a single point of contact for lithium battery safety and technical matters relating thereto within the Department of the Navy. Specific questions related to the design, use, packaging, storage, transportation and disposal of these batteries are to be addressed to the Commander, Naval Sea Systems Command (SEA 04H), Washington, D.C. 20362.

b. Each program manager, designer, producer, processor, packager, handler or user of lithium batteries is responsible for safety within his realm of activity.

c. All Systems Commanders, Project Managers and Research and Development Activities under the command of the Chief of Naval Material are responsible for implementing the Lithium Battery Safety Program within their cognizant material support area. Specifically:

(1) Assure that lithium battery safety criteria are incorporated in the design of lithium batteries and all lithium powered equipment under their cognizance.

(2) A systems safety approach as prescribed in references (a) and (b) to ensure the safety of the lithium battery in the end item of use and its interface with launch platforms (i.e., aircraft/ships) shall begin with the inception of a program (e.g. operational requirement (OR), development proposal (DP), Navy Development Concept Paper (NDCP) of a system, or the modification of an existing system). NDCPs and other development or contractual documents shall reflect a formal program for a systems safety evaluation and shall provide for adequate funding of the program. The safety program shall remain in effect through the entire life cycle (e.g. storage, use and disposal) of the system.

(3) Advise the Commander, Naval Sea Systems Command (SEA 04H) of plans for new or modified lithium batteries and all lithium powered equipment, for new or changes to processing methods, stowage, packaging and handling, shipping and usage; and plan and fund for necessary safety studies, tests and documentation. All Commands shall ensure that they neither introduce nor change lithium battery systems nor their related procedures and documentation without adequate safety studies. These safety studies, tests and documentation will be reviewed by the Commander of the Naval Sea Systems Command (SEA 04H) prior to recommendation of approval.

D. M. JOHNSON
Principal Deputy Commander
for Logistics

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USE, PACKING, STORAGE, TRANSPORTING, AND DISPOSAL OF LITHIUM BATTERIES

1. Acquisition

a. Programs anticipating the use of lithium batteries shall submit to the Naval Surface Weapons Center White Oak, Silver Spring MD 20910 via the Commander, Naval Sea Systems Command (SEA 04H) Washington, D. C. 20362 a data package validating the selection of the lithium battery and describing: (1) the proposed battery, e.g. design, geometry and electrochemical system, (2) the equipment: design, current drain, types of safety features, battery use, case strength, free volume, and the logistic and operational use sequence of the item in which the battery is to be used. Upon completion of a preliminary review, a safety assessment of the proposed battery use, including recommendations to enhance safety will be presented to the cognizant command by COMNAVSEASYSCOM.

b. Requests for a safety review in consideration of approval for service use are to be submitted to NAVSEASYSCOM (SEA 04H) and are to include the summarized results of the System Safety Program and the results of the test identified in enclosure (2). A recommendation for approval for service use will be predicated on this information.

c. All lithium cells shall be color coded and marked to indicate the information indicated in Figure 1. In addition to this information, the end item shall have an external label warning users of the hazards associated with lithium batteries and the unit packages shall be marked with the Hazardous Material Marking Symbol of NAVSUP Publication 4500 (Consolidated Hazardous Item List).

d. In development and procurement actions, applicable portions of the current issue of MIL-STD-882 (System Safety Program Requirements) should be invoked by contract.

e. Activities procuring batteries for limited or full scale production shall ensure that configuration management is imposed on the battery and its packaging in accordance with MIL-STD-480. In addition to the usual definition, a Class I change shall be defined as any change affecting safety characteristics of the battery, such as cell manufacturer, type, method of fabrication, insulation, fusing, circuit load changes, battery packaging, etc. Class I battery changes shall be coordinated with NSWC. Class I packaging changes shall be reviewed by personnel formally qualified in hazardous material packaging and qualified to sign a certificate of equivalency pursuant to reference (c).

f. Safety qualification testing for a specific application shall include environmental testing representative of the actual environments to be encountered by the complete end item, including battery, in the logistic cycle of that application.

g. Manufacturers shall be required to provide Material Safety Data sheets in accordance with DAR 7-104.98.

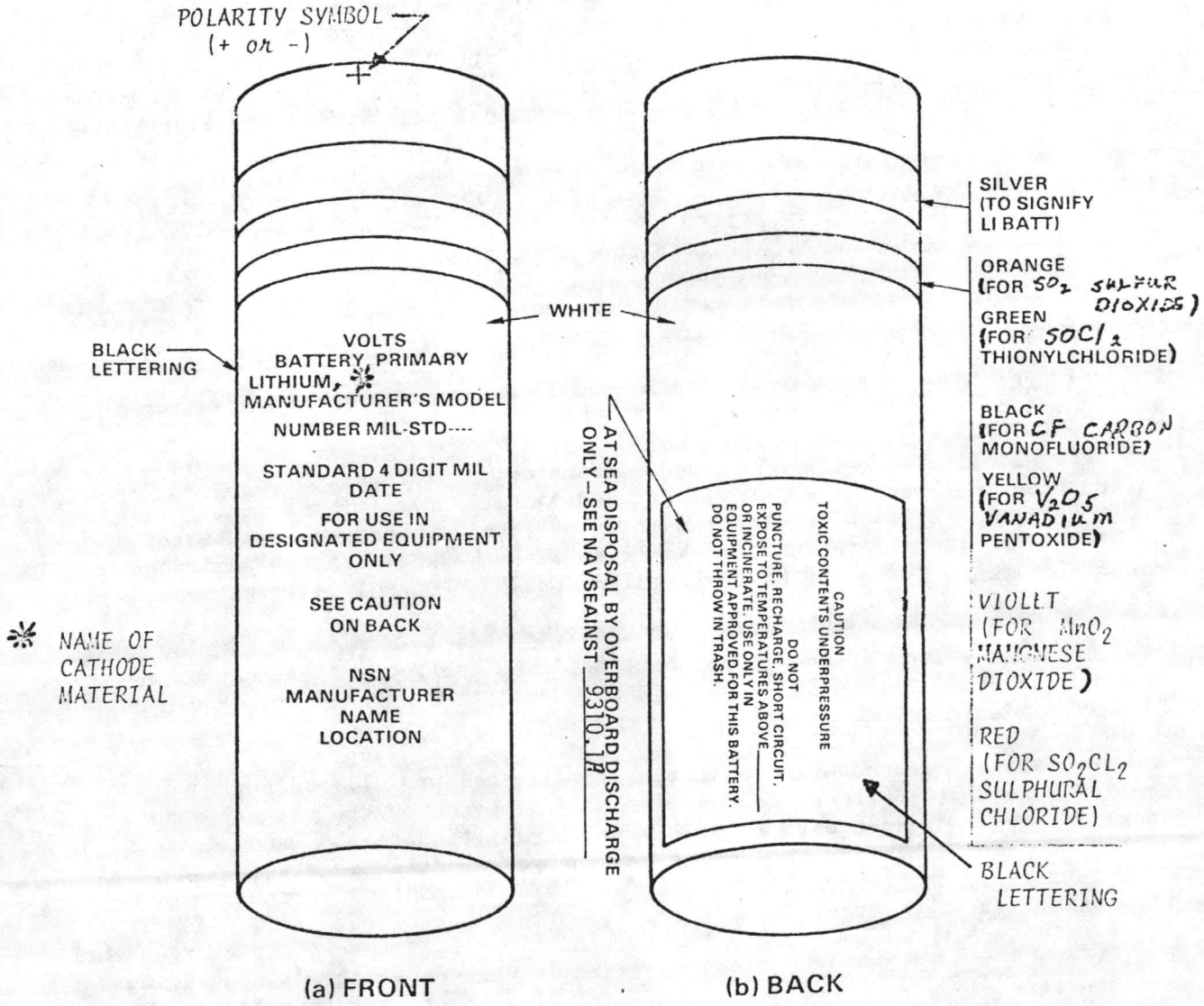

Fig. 1 LITHIUM CELL LABELING

Enclosure (1)

2. Design

a. All unit cells shall be constructed so that the cell case to cover seal is a continuous weld, free from holes and other imperfections. The seal between the electrode and the cover shall be of the glass or ceramic to metal type and free from imperfections. Each cell, battery and battery enclosure must incorporate a safety venting device or be designed and manufactured in such a manner that will preclude a violent rupture condition. Nothing shall be done in the design and construction that will degrade the vent.

b. Each battery used as the power source shall contain a suitable over-current device that will fail open if the battery is discharged at an excessive rate. Batteries shall be overcurrent protected in the ground lead of each series string. Each separate circuit shall be protected. If the battery is tapped to provide different output voltages each tap shall be protected with an overcurrent device. In batteries consisting of series-parallel strings, the paralled strings shall be protected to prevent any possibility of charging.

c. Consideration shall be given to the use of thermal protection devices which will fail open at temperatures in excess of 91°C.

d. Select cells as small as possible for the task.

e. Lithium batteries shall be constructed so that they are not inter-changeable with commercial flashlight or radio batteries.

f. In development programs, assembly of batteries by user personnel shall be avoided.

g. Avoid potting of cells or batteries. If potting is essential, use only a material with good heat transfer characteristics and assure that cell vent operation will not be impeded or obstructed in any way.

h. If the battery is not installed in equipment, the leads or connector plug shall be taped, guarded or otherwise given positive protection against accidental shorting.

i. Design the equipment with a special compartment for the battery. This compartment shall have no interior projections or sharp edges that could deteriorate the insulation around the battery. The battery shall be secured within the compartment to resist shock and vibration for end item use.

j. Battery switches in the end item shall be carefully selected to prevent accidential battery turn-on.

3. Use

a. Lithium batteries shall be used only in their designed application.

b. Partially or fully discharged lithium batteries shall be removed from associated equipment upon completion of useful life and disposed of in accordance with paragraph 7. The exposed terminals shall be insulated to prevent short circuts.

c. In the event of an accident, incident or malfunction, either with or without visible damage to the battery, notify the appropriate authorities in accordance with the reporting procedures of Chapter 7 of OPNAVINST 5102.1 "Accident Investigation and Reporting". Report Symbol OPNAV 5102-2 is assigned the Material (property) Damage Report.

4. Packaging

For new lithium batteries, the basic packing, marking and shipping requirements imposed by the Department of Transportation are contained in Attachment A. In addition to the minimum requirements of Attachment A, Navy activities desiring to use lithium batteries shall:

(1) Ensure that a complete design disclosure is obtained on the packing of the specific battery, preferably prior to any shipment, but in any case no later than release for limited production or full scale production whichever occurs first.

(2) Ensure that the design disclosure is incorporated in the appropriate acquisition specification, contract and manuals. Descriptive specification language shall be supplemented by DOD-D-1000 Drawings or Figures in the specification as appropriate.

(3) Ensure that the adequacy of the packaging is demonstrated by tests and obtain a test report. The minimum package performance level is contained in MIL-STD-648. Other tests required by Attachment A shall also be performed.

(4) Ensure that where batteries are entered in the supply systems for organizational or intermediate maintenance level replacement, batteries so acquired are packaged so as to be capable of shipment by "cargo only" aircraft.

b. It may develop that it is impractical or undesirable logistically to distribute devices containing lithium batteries in packages conforming literally to the package specificatons listed in DOT-E-7052. In such cases, the cognizant SYSCOM official authorized to sign a Certification of Equivalency (COE) as delegated pursuant to reference (c) may do so when satisfied that the container proposed is of equal or greater strength and efficiency than those specified. The data package accompanying such requests shall contain:

(1) Results of safety tests required herein plus NAVSEASYSCOM (SEA 04H) recommendation for approval.

(2) Objective evidence (stress calculations may be used for sealed devices) that the container will meet performance requirements. To be approved for commercial cargo aircraft or for Military Aircraft transportation, evidence must show that any gas venting will be contained within the total package (device plus shipping container).

c. Used lithium batteries for disposal must be individually sealed in a plastic bag or be individually wrapped in electrical insulated material and be placed in DOT approved shipping containers in accordance with 49 CFR 13.206(f).

5. Storage

a. New lithium batteries shall be stored as follows:

(1) Lithium batteries shall be stored in their original shipping containers in a cool, sprinkler protected ventilated shelter.

(2) The storage area shall be isolated from other hazardous and combustible material and used only for the storage of unused lithium batteries.

(3) Since the effect of mass storage on the hazard degree is not known, the quantity stored in an area shall be kept to a reasonable minimum.

(4) Batteries in storage shall be retained in unit packages, preferably shipping containers, to prevent heat transfer between batteries.

(5) Storage temperature above 130°F shall be avoided.

(6) Special care shall be exercised in handling and moving containers to prevent crushing or puncturing.

b. Used lithium batteries shall be stored in the following manner:

(1) Used lithium batteries shall be packaged in accordance with paragraph 4c above.

(2) A remote collection point and storage area, sprinkler protected (if feasible), separate from other combustible material shall be established for batteries awaiting disposal.

(3) Used lithium batteries shall not be allowed to accumulate and disposal shall be effected promptly (no more than 30 lbs or 30 days).

(4) Lithium batteries are not to be disposed of nor transported with normally generated refuse.

(5) Used lithium batteries shall not be pierced, crushed, burned, dropped, cannibalized, dismantled, modified or otherwise carelessly handled, nor shall they be short circuited, charged or reused.

c. When entering a storage space in which lithium batteries may have vented gas, supplied air respirators or self-contained breathing apparatus approved by the National Institute for Operation Safety and Health (NIOSH) shall be worn.

6. Transportation

a. All transportation of new lithium batteries on public domain is controlled by federal law regulating shipment of hazardous materials. The general regulation is stated in 49 CFR 172.101, 173.206(e)(1) and 175.3. The Materials Transportation Bureau, Research and Special Programs Administration, U.S. Department of Transportation, Washington, D. C. 20590 has issued an exemption, (see attachment A) DOT-E 7052, which permits shipment of lithium

cells and batteries by motor vehicle, railfreight, cargo vessel and cargo-only aircraft provided the detailed requirements of the exemption have been met. Advise potential suppliers not listed in the lastest issue of Attachment A that they must become a party thereto prior to shipping batteries by any mode.

b. All transportation of used lithium batteries on public domain is controlled by federal law regulating shipment of hazardous materials. The Department of Transportation has issued an exemption,(see Attachment B) DOT-E-8441, which permits shipment of waste lithium batteries to a disposal site by motor vehicle only.

7. Disposal

a. At sea, batteries shall be disposed of by discharge overboard in deep water (in excess of 500 feet) outside the prohibited zone (50 mile limit). Do not store for shore disposal.

b. Ashore, batteries shall be disposed of as follows:

(1) Turn into the nearest Public Works Center for disposal by the Defense Logistics Agency (D.L.A.).

(2) Burn in an approved lithium battery incinerator. Details of such incinerators are available from SEA 04H.

(3) Buried in a controlled hazardous waste landfill.

SAFETY AND PERFORMANCE TEST FOR QUALIFICATION OF LITHIUM BATTERIES

1. General. This document establishes the minimum safety test requirements for lithium batteries in lithium battery powered equipment when used by the Navy or on Navy facilities. It also specifies the procedure, equipment and pass-fail criteria.

2. Pass-Fail Criteria. It is not necessary to regard a failure of the lithium batteries or lithium powered equipment to meet the "passing" criteria as grounds for an automatic rejection of the equipment for service use. Any such items which fail to meet such criteria will be rejected only if a technical evaluation of the test results by SEA 04H establishes that rejection is the appropriate course of action. The passing criteria are as follows:

(a) Unit Criteria

(1) Land	Unit has a fail safe vent system to keep pressure 50% below the yield point of the unit.
(2) Aircraft	Same as above except no external fire or flame.
(3) Surface Ship	Same as (2) above.
(4) Submarine	Total containment; generated internal pressure shall stay under 50% of the failure pressure of the housing.

(b) Relief Valve Criteria

(1) If pressure relief valves are provided in the unit they must prevent the pressure of all of the tests in paragraph 3 from reaching a peak value of 50% of the yield pressure of the unit. If the peak pressure falls below or is equal to 50% of the yield pressure of the unit in all of the tests the unit will be considered safe. If the peak pressure in any tests exceeds 50% of the yield pressure of the unit before venting that unit will be considered unsafe.

(2) If pressure relief valves are not provided the recorded peak pressure in any test must not exceed 50% of the failure pressure of the unit for the unit to be considered safe.

3. Test. The following tests are to evaluate the safety and performance of the lithium batteries and the lithium powered equipment:

WARNING: The following tests will most likely cause violent venting of batteries; therefore all possible safety precautions shall be observed.

a. TEST ITEMS A minimum of nine (9) units with batteries installed, along with two (2) spare battery packs, shall be provided.

b. TEST INSTRUMENTATION All three tests shall be instrumented as described in this paragraph. The instrumentation for the tests shall include six (6) thermocouples capable of measuring and withstanding temperatures up to 800°C, two (2) voltage test leads, one set of power leads and a pressure transducer capable of measuring pressure up to the failure pressure of the unit. Four (4) thermocouples shall be placed inside the unit in the following manner: one secured on each end of the battery pack, one secured at the center of the battery pack and one in the air space surrounding the battery pack. The remaining two (2) thermocouples shall be located and secured on the outside of the unit 180° apart near the battery pack. The pressure transducer shall continually monitor the pressure inside the battery pack housing.

c. CONSTANT CURRENT DISCHARGE & REVERSAL TEST This test shall consist of a constant current discharge using a DC power supply. The internal fusing shall be bypassed (shorted) and the discharge shall be performed at a current equal to the value of the battery pack fuse. After the battery voltage reaches zero volts the discharge shall be continued into voltage reversal at the same current for a time equivalent to 1.5 times the advertised ampere-hour capacity of the battery pack. This test shall be completed on three units; voltage, pressure and temperatures shall be continously monitored and recorded.

d. SHORT CIRCUIT TEST This test shall consist of shorting the battery (after all internal electrical safety devices have been bypassed) through a load of 0.01 ohm or less and leaving the load attached for not less than 24 hours. This test shall be completed on three units; voltage, current, pressure and temperature shall be continously monitored and recorded.

e. HIGH TEMPERATURE TEST This test shall consist of heating the battery pack inside the unit at a rate of 20°C rise per minute up to a temperature of 500°C. This test shall be completed on three units; voltage, pressure and temperature shall be continously monitored and recorded.